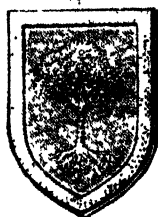




AGRICULTURAL RESEARCH INSTITUTE
PUSA

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LX



January 1935

CALENDAR, 1935.

NOTE 1.—Meetings of the Society are held, with very few exceptions, on alternate Tuesdays throughout the year, accompanied on each occasion by a Show of horticultural produce. All meetings, other than the Great Spring Show at Chelsea and the Autumn Show at the National Hall, Olympia, take place at the Society's Halls. Fellows' tickets admit to all the Shows mentioned in this Calendar (but see Chelsea—first day).

The price of admission for Non-Fellows to the ordinary Fortnightly Meetings is:

For two-day Shows, 2s. 6d. on the first day, up to 6 P.M.
1s. 0d. " " after 6 P.M.
1s. 0d. on the second day.

For one-day Shows, 2s. 6d. all day.

A fully-licensed Restaurant is available for Fellows and friends.

NOTE 2.—Fellows are particularly requested to note the time to which Shows are open on the first day of the two-day Shows, namely 7.30 P.M.

NOTE 3.—The following Committees meet at all Fortnightly Meetings, and at the Daffodil Show, April 16:

Orchid Committee	11.45 A.M.
Fruit and Vegetable Committee	12 NOON
Floral A Committee	12.15 P.M.
Floral B Committee	12.15 P.M.
Library Committee	3.30 P.M.
Scientific Committee	4 P.M.

Days and times of other meetings of Committees so far as fixed are given in the Calendar.

JANUARY

		Time.
8	Fortnightly Meeting. Flowers in season. Cypripediums	1-5 P.M.
	Lecture by Mr. R. H. Mattocks (Institute of Landscape Architects) on "The Park System and its Place in the Town Plan"	3.30 P.M.
14	Entries for General and Teachers' Examinations close.	
22	Fortnightly Meeting. Flowers in season. Special exhibit from Wisley: "Winter Stages of Pests and Diseases of Fruit and other Plants"	1-5 P.M.
	Lecture by Mr. J. I. Wall on "The Alpine House at Wisley"	3.30 P.M.

FEBRUARY		<i>Time.</i>
1	Entries for National Diploma in Horticulture Examinations close.	
4	Entries for British Floral Art Diploma Spring Examination close.	
5	Fortnightly Meeting. Flowers in season . . . Narcissus and Tulip Committee . . . Lecture by Mr. A. Payne on "Salads in the Private Garden" . . .	1-5 P.M. 11 A.M. 3.30 P.M.
19	Fortnightly Meeting. Flowers in season . . . Narcissus and Tulip Committee . . . Joint Rhododendron Committee . . . ANNUAL GENERAL MEETING . . .	1-7.30 P.M. 11 A.M. 11.15 A.M. 3 P.M.
20	Second day of Meeting . . .	10 A.M.-5 P.M.
MARCH		
4	Entries for Chelsea Show close.	
5	Fortnightly Meeting. Flowers in season. Cymbidiums . . . Narcissus and Tulip Committee . . . Joint Rhododendron Committee . . . Lecture by Mr. E. R. Luckhurst on "The Small Greenhouse and its Plants" . . .	1-7.30 P.M. 11 A.M. 11.15 A.M. 3.30 P.M.
6	Second day of Meeting . . .	10 A.M.-5 P.M.
13	*Demonstration at Wisley (weather permitting): "Seed Sowing—Indoors and Outdoors" . . .	2-4 P.M.
14	*Second day of Demonstration . . . British Floral Art Diploma. Written Examination.	2-4 P.M.
19	Fortnightly Meeting. Flowers in season. Sewell Medals for Alpines . . . Narcissus and Tulip Committee . . . Joint Rhododendron Committee . . . Lecture by Dr. Roger Smith on "New Alpines" . . . Discussion on "The Earliest Daffodils" in Restaurant, Old Hall . . .	1-7.30 P.M. 11 A.M. 11.15 A.M. 3.30 P.M. 4.30 P.M.
20	Second day of Meeting . . .	10 A.M.-5 P.M.
	*Practical Demonstration at Wisley (weather permitting): "Rose Pruning" . . .	2-4 P.M.
21	*Second day of Demonstration . . .	2-4 P.M.
25	General Examination in Horticulture (Seniors and Juniors).	
27 & 28	British Floral Art Diploma. Practical Examination.	
30	Teachers' Examination in School and Cottage Gardening.	
APRIL		
2	Fortnightly Meeting. Flowers in season . . . Narcissus and Tulip Committee . . . Joint Iris Committee . . . Joint Rhododendron Committee . . . Lecture by Professor T. T. Barnard on "Cape Bulbs" . . . Alpine Garden Society's Show (Old Hall) . . .	1-7.30 P.M. 11 A.M. 11.15 A.M. 11.15 A.M. 3.30 P.M. 1-7.30 P.M.
3	Second Day of Meeting . . . Lecture by Dr. Th. Adams and Mr. G. A. Jellicoe (Institute of Landscape Architects) on "The Relationship of Landscape Design to Civic Design" . . .	10 A.M.-5 P.M. 3.30 P.M.
6	London Gardens Society. Exhibition of Spring Flowers (Old Hall) . . .	1-7 P.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

		<i>Time.</i>
APRIL		
9	British Carnation Society's Show (Old Hall)	1-7.30 P.M.
	Joint Perpetual-Flowering Carnation Committee	12 NOON.
10	British Carnation Society's Show continued	10 A.M.-5 P.M.
	*Demonstrations at Wisley (weather permitting): "Spring Spraying of Fruit Trees," "Shrub Pruning"	2-4 P.M.
11	*Second day of Demonstrations	2-4 P.M.
13	Entries for Daffodil Show close.	
16	FORTNIGHTLY MEETING. DAFFODIL SHOW AND CONFERENCE. (See special schedule.)	
	Daffodils. Special exhibit from Wisley: "Pests and Diseases of Daffodils"	1-7.30 P.M.
	Narcissus and Tulip Committee	12 NOON.
	Joint Iris Committee	11.15 A.M.
	Joint Rhododendron Committee	11.15 A.M.
	CONFERENCE: Opening address: Daffodils past and present	3.30 P.M.
17	Second day of Meeting and Daffodil Show.	
	CONFERENCE: Daffodil species. The Daffodil Trials: (a) General survey; (b) The Wisley Trials; (c) The Kirton Trials; (d) The Gulval Trials	10.30 A.M.
	(a) The preparation of Daffodils for forcing; (b) The breeding of Daffodils	2.30 P.M.
18	CONFERENCE: (a) The commercial cultivation of Daffodils for flower and bulb production; (b) Diseases and pests of the Daffodil: their detection and control	10.30 A.M.
	Excursion to the Society's Gardens, Wisley, and Mr. F. A. Secrett's flower farm at Walton-on-Thames	1.30 P.M.
19	Excursion to the bulb-growing district of Lincolnshire. Particulars from the Secretary.	
17	Closing date for entries for Amateurs' Flower Show.	
24	Fortnightly Meeting. Flowers in season.	
	Auricula Cup competition	1-7.30 P.M.
	National Auricula and Primula Society's Show (New Hall)	1-7.30 P.M.
	Early Market Produce Show (Old Hall)	1-7.30 P.M.
	Narcissus and Tulip Committee	11 A.M.
	Joint Iris Committee	11.15 A.M.
	Joint Rhododendron Committee	11.15 A.M.
	Lecture by Mr. F. A. Secrett on "Irrigation of Horticultural Crops"	3.30 P.M.
25	Second day of Meeting	10 A.M.-5 P.M.
27	National Diploma in Horticulture. Written Examination.	
30	Rhododendron Association's Show. Rhododendrons only (New Hall). Special exhibit from Wisley: "Pests of Rhododendrons"	1-7.30 P.M.
	Joint Rhododendron Committee	12.15 P.M.
	Floral Committee B	12.15 P.M.
	Lecture by Sir Daniel Hall on "Tulips"	3.30 P.M.
	Alpine Garden Society's Show (Old Hall)	1-7.30 P.M.
MAY		
1	Second day of Rhododendron Show	10 A.M.-5 P.M.
8	Fortnightly Meeting. Flowers in season	1-7.30 P.M.
(Wed.)	Narcissus and Tulip Committee	11 A.M.
	Joint Iris Committee	11.15 A.M.
	Joint Rhododendron Committee	11.15 A.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

		<i>Time.</i>
MAY		
8	Lecture by Lady Rockley on "Wild Flowers of the Dominions"	3.30 P.M.
	Lily Group Discussion: "Cultivation of Lilies in Pots" (Restaurant, Old Hall)	4.30 P.M.
9	Second day of Meeting	10 A.M.—5 P.M.
21 (Tues.)	CHELSEA SHOW. Royal Hospital Gardens. (See special schedule.) Admission of Fellows by special invitation only	4 P.M.
	Orchid Committee	2 30 P.M.
	Narcissus and Tulip Committee	3 P.M.
	Joint Iris Committee	3 P.M.
	Joint Rhododendron Committee	3 P.M.
	Fruit and Vegetable Committee	4 P.M.
	Floral A Committee	4 P.M.
	Floral B Committee	4 P.M.
22 (Wed.)	CHELSEA SHOW. Royal Hospital Gardens. Private view for holders of Fellows' tickets only	8 A.M.—12 NOON, 12 NOON—8 P.M.
	Public admitted from noon	
23 (Thurs.)	CHELSEA SHOW. Royal Hospital Gardens. Private view for holders of Fellows' tickets only	8—10 A.M.
	Public admitted from 10 A.M.	10 A.M.—8 P.M.
24 (Fri.)	CHELSEA SHOW. Royal Hospital Gardens	9 A.M.—5 P.M.
JUNE		
4	Fortnightly Meeting. Flowers in season	1-7.30 P.M.
	Joint Iris Committee	11.15 A.M.
	Joint Rhododendron Committee	11.15 A.M.
	Lecture by Mr. R. C. and Mr. R. F. Notcutt on "The best Japanese Cherries for an English Garden"	3.30 P.M.
5	Second day of Meeting	10 A.M.—5 P.M.
	Lecture by Mr. E. Cheal (Institute of Landscape Architects) on "Pruning and Care of Trees and Shrubs"	3.30 P.M.
6	Iris Society's Show. Special exhibit from Wisley: "Iris Diseases"	1-7.30 P.M.
	Joint Iris Committee	2.15 P.M.
7	Second day of Iris Show	10 A.M.—5 P.M.
14	Teachers' Advanced Practical Examination at Wisley.	
17-21	National Diploma in Horticulture. Preliminary Practical Examination at Wisley.	
18	Fortnightly Meeting. Flowers in season. Sewell Medals for Alpines	1-7.30 P.M.
	London and South of England Viola and Pansy Society's Show.	
	Joint Iris Committee	11.15 A.M.
	Joint Rhododendron Committee	11.15 A.M.
	Joint Delphinium Committee	11.15 A.M.
	Lecture by Mr. C. T. Musgrave on "Gentians"	3.30 P.M.
	Lily Group Discussion: "Californian Lilies" (Restaurant, Old Hall)	4.30 P.M.
19	Second day of Meeting	10 A.M.—5 P.M.
25	Amateurs' Flower Show. (See special schedule.) Special exhibit from Wisley: "Pests and Diseases"	1-7 P.M.
	Joint Iris Committee	11.15 A.M.
	Joint Rhododendron Committee	11.15 A.M.
	Joint Delphinium Committee	11.15 A.M.
	Orchid Committee	11.45 A.M.
	Floral A Committee	12.15 P.M.
	Floral B Committee	12.15 P.M.
25-28	National Diploma in Horticulture. Final Practical Examination at Wisley.	
27	British Delphinium Society's Show	1-7.30 P.M.
	Joint Delphinium Committee	12.15 P.M.

JULY		Time.
2	Fortnightly Meeting. Lilies and flowers in season (New Hall). Competition for best hybrid Lily	1-7.30 P.M.
	Joint Iris Committee	11.15 A.M.
	Joint Border Carnation Committee	11.30 A.M.
	Joint Delphinium Committee	11.15 A.M.
	Lily Group Discussion: "Lilies exhibited"	3.30 P.M.
	Cactus and Succulent Society's Show (Old Hall)	1-7.30 P.M.
	Lily Group Dinner in Restaurant, New Hall	7 P.M.
3	Second day of Meeting	10 A.M.-5 P.M.
5	National Sweet Pea Society's Show (New Hall)	1-7.30 P.M.
9	Entries for Soft Fruit Show close.	
	Joint Delphinium Committee	11.15 A.M.
	Joint Border Carnation Committee (if called)	11.30 A.M.
13	Lily Group Garden Meeting. (Particulars from the Secretary.)	
16	Fortnightly Meeting. Competition for best hybrid Lily	1-7.30 P.M.
	CHERRY AND SOFT FRUIT CONFERENCE AND SHOW and National Farmers' Union Cherry Show	1-7.30 P.M.
	Joint Iris Committee	11.15 A.M.
	Joint Dahlia Committee	11.15 A.M.
	Joint Border Carnation Committee	11.30 A.M.
	Joint Delphinium Committee, at the British Delphinium Society's Provincial Show at Roundhay Park, Leeds	11.45 A.M.
	CONFERENCE: Opening Address; Cherries for Market Growing; Growing Healthy Strawberries	3-5 P.M.
17	Second day of Meeting.	
	CONFERENCE: Mannuring and Nutrition of Soft Fruits; Growing Healthy Raspberries	11 A.M.-1 P.M.
	Soft Fruits for the Private Garden; Blackberries and like Berries for Garden Purposes; Canning for Domestic Purposes	3-5 P.M.
23	National Carnation and Picotee Society's Show (Old Hall)	1-7.30 P.M.
	Joint Border Carnation Committee	3 P.M.
24	Second day of Carnation Show	10 A.M.-5 P.M.
	*Demonstration at Wisley (weather permitting): "Summer Pruning Fruit Trees and Shrubs"	2-4 P.M.
25	*Second day of Demonstration	2-4 P.M.
30	Fortnightly Meeting. Flowers in season.	
	Clay Cup for Scented Roses	1-7.30 P.M.
	Joint Dahlia Committee	11.15 A.M.
	Joint Border Carnation Committee	11.30 A.M.
31	Second day of Meeting	10 A.M.-5 P.M.
AUGUST		
3	Entries for Great Autumn Show close.	
13	Fortnightly Meeting. Flowers in season.	
	Foremarke Cup for Gladioli	1-6 P.M.
	British Gladiolus Society's Show (Old Hall)	1-7.30 P.M.
	Joint Dahlia Committee	11.15 A.M.
	Lecture by the Hon. Mrs. Ryder on "The Flowers of the Karoo" (Old Hall)	3.30 P.M.
14	British Gladiolus Society's Show (Old Hall, second day)	10 A.M.-5 P.M.

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		<i>Time.</i>
AUGUST		
27	Fortnightly Meeting. Flowers in season.	
	Sewell Medal for Alpines	1-6 P.M.
	Joint Dahlia Committee	11.15 A.M.
	Lecture by Mr. Ben Wells, jun., on "New Herbaceous Plants"	3.30 P.M.
30	London Allotments and Gardens Show	
	Society's Exhibition	2.30-8 P.M.
31	Second day of Exhibition	10 A.M.-6 P.M.
SEPTEMBER		
2	Entries for British Floral Art Diploma Examination Autumn Examination close.	
3	National Dahlia Society's Show	1-7.30 P.M.
	Joint Dahlia Committee	12.15 P.M.
4	Second day of Show	10 A.M.-5 P.M.
6	London Gardens Society. Exhibition of Flowers	2.30-9 P.M.
7	Second day of Exhibition	2.30-6.30 P.M.
10	Fortnightly Meeting. Flowers in season.	1-6 P.M.
	Joint Dahlia Committee	11.15 A.M.
	Lecture by Dr. Fred Stoker on "The Cultivation of Ericaceous Plants"	3.30 P.M.
13	National Rose Society's Show	12 NOON-7 P.M.
14	Second day of Rose Show	11 A.M.-5 P.M.
19	British Floral Art Diploma. Written Examination.	
25	AUTUMN SHOW. National Hall, Olympia.	
(Wed.)	(See special schedule)	11 A.M.-9.30 P.M.
	Joint Dahlia Committee	11.15 A.M.
	Orchid Committee	11.45 A.M.
	Fruit and Vegetable Committee	12 NOON
	Floral A Committee	12.15 P.M.
	Floral B Committee	12.15 P.M.
26	AUTUMN SHOW. National Hall, Olympia.	
	Second day	10 A.M.-9.30 P.M.
27	AUTUMN SHOW. National Hall, Olympia.	
	Third day	10 A.M.-5 P.M.
OCTOBER		
1	Entries for Fruit and Vegetable Show close.	
2 & 3	British Floral Art Diploma. Practical Examination.	
8	FRUIT AND VEGETABLE SHOW. (See special schedule)	1-7.30 P.M.
	Special exhibit from Wisley: "Pests and Diseases of Fruit and Vegetables."	
	Joint Dahlia Committee	11.15 A.M.
	Orchid Committee	11.45 A.M.
	Fruit and Vegetable Committee	12 NOON
	Floral A Committee	12.15 P.M.
	Floral B Committee	12.15 P.M.
	Lecture by Mr. G. Fox Wilson on "Fruit Pests: their Effect and Detection"	3.30 P.M.
9	Second day of Fruit and Vegetable Show	10 A.M.-4 P.M.
15	Fortnightly Meeting. Orchids, Stove and Greenhouse Plants and Berried Shrubs	1-7.30 P.M.
	Special Show of Pictures (Old Hall)	1-7.30 P.M.
	Joint Dahlia Committee	11.15 A.M.
	Lecture by Mr. E. L. Hillier, jun., on "Some Outstanding New and Little-Known Trees and Shrubs"	3.30 P.M.
	Lily Group Discussion: "Planting of Lilies" (Restaurant, Old Hall)	4.30 P.M.
16	Second day of Meeting	10 A.M.-4 P.M.
	Special Show of Pictures (Old Hall)	10 A.M.-4 P.M.
NOVEMBER		
5	Fortnightly Meeting. Flowers in season.	1-5 P.M.
	Masters Memorial Lecture (1), by Sir William Wright Smith, on "Problems connected with the Classification of Plants"	3.30 P.M.

		<i>Time.</i>
NOVEMBER		
6	National Chrysanthemum Society's Show .	1-7.30 P.M.
	*Demonstration at Wisley (weather permitting) : "Planting Fruit Trees and Roses"	2-4 P.M.
7	Second day of Chrysanthemum Show .	10 A.M.-5 P.M.
	*Second day of Demonstration at Wisley .	2-4 P.M.
19	British Carnation Society's Show (Old Hall) .	1-7.30 P.M.
	Joint Perpetual-Flowering Carnation Committee	12 NOON.
20	Second day of Carnation Show	10 A.M.-5 P.M.
26	Fortnightly Meeting. Flowers in season .	1-5 P.M.
	Masters Memorial Lecture (2), by Sir William Wright Smith, on "Problems connected with the Classification of Plants" . . .	3.30 P.M.
DECEMBER		
4	*Practical Demonstration at Wisley (weather permitting) : "Pruning Fruit Trees" .	2-4 P.M.
5	*Second day of Demonstration	2-4 P.M.
10	Fortnightly Meeting. Flowers in season .	1-5 P.M.
	Institute of Landscape Architects. Annual Meeting	3.30 P.M.
1936		
JANUARY		
14	Fortnightly Meeting. Flowers in season .	1-5 P.M.
28	Fortnightly Meeting. Flowers in season .	1-5 P.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

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* Elected annually at Annual General Meeting.

† Retire at Annual Meeting, 1935.

THE SOCIETY AND ITS WORK.

THE purpose of the Society is to encourage and improve the science and practice of horticulture in all its branches. It consists of Fellows, Associates, Honorary Fellows and Associates of Honour, numbering in all over 29,000, and over 700 Horticultural Societies are affiliated to it.

It is governed by a President and Council of fifteen members, of whom one-fifth retire annually in February, when the election of President, Vice-Presidents, Treasurer, and three new members of Council takes place.

The Society was founded at a meeting held on March 7, 1804, at Hatchard's book-shop in Piccadilly—a fact recently commemorated by a bronze plaque placed upon the house. Mr. JOHN WEDGWOOD was in the Chair, and there were also present the Right Hon. CHARLES GREVILLE, the Right Hon. Sir JOSEPH BANKS, P.R.S., WILLIAM TOWNSEND AITON, RICHARD ANTHONY SALISBURY, WILLIAM FORSYTH, and J. DICKSON. These gentlemen formed the nucleus of the Horticultural Society of London, and the avowed duty of that Society was "to collect every information respecting the cultivation of all plants and trees" and "to foster and encourage every branch of horticulture."

The meetings of the Society were first held in the rooms of the Linnean Society, then in Regent Street, and for many years they took place at 21 Regent Street; then for a few months at St. Martin's Place, Trafalgar Square, whence they were transferred under the Presidency of H.R.H. the PRINCE CONSORT to premises of some magnificence at South Kensington, on land now partly occupied by the Imperial Institute.

These premises finally proved too expensive to maintain, and for this and other reasons the Society's offices were removed in 1888 to rooms in Victoria Street, and the meetings took place in the London Scottish Drill Hall, Buckingham Gate, S.W., until 1904, when the Hall and Offices in Vincent Square, built by subscription to commemorate the Society's Centenary, were opened by His Majesty King EDWARD VII. From 1888 under the Presidency of Sir TREVOR LAWRENCE, Bt., and the Secretaryship of the Rev. WILLIAM WILKS, M.A., the story of the Society had been one of progress. This progress continued after the opening of the Hall until the accommodation both for offices and meetings had been outgrown, and in 1928 the New Hall in Greycoat Street was opened by H.R.H. Princess MARY, and the offices in Vincent Square were rearranged and a fine new Library was constructed on the top floor.

The Society was incorporated by Royal Charter, granted on April 7, 1809, and in 1861, on its move to South Kensington, a new Charter was granted to it under the style and title of the Royal Horticultural Society. A supplementary Charter was granted in 1899, and as the Society had continued to increase beyond expectations a new Charter was granted in 1928, coincident with the opening of the New Hall.

FELLOWSHIP OF THE SOCIETY.

Anyone interested in horticulture is eligible for Fellowship and is invited to become a Fellow. Candidates for Fellowship must be nominated on a special form, a copy of which is enclosed, and the nomination form must be signed by a Fellow. Privileges of Fellowship, which include admission to all meetings and to the Society's Garden at Wisley, the use of the Library, a copy of the JOURNAL, etc., are set out on the Nomination Form. The entry fee is at present in abeyance. The annual subscription is from one to four guineas.

ASSOCIATES OF THE SOCIETY.

Candidates for election as Associates must be *bona fide* employed in horticulture, and must be nominated by two Fellows. They pay 10s. 6d. per annum.

HONORARY FELLOWS AND ASSOCIATES OF HONOUR
are appointed by the Council.

HONORARY FELLOWS

- AUCHTER, Prof. E. C., U.S. Department of Agriculture, Bureau of Plant Industry, Washington, D.C., U.S.A.
 BAILEY, Prof. L. H., LL.D., Litt.D., Dean Emeritus, Cornell University, Ithaca, New York, U.S.A.
 BAKER, F. J., A.R.C.S., Fisherswood, Sharnall Street, Hoo, Rochester, Kent.
 BARKER, Prof. B. T. P., M.A., University of Bristol Research Station, Long Ashton, Bristol.
 BLACKMAN, Prof. V. H., M.A., Sc.D., F.R.S., Imperial College of Science, S.W.
 BOIS, Prof. D. G. J. M., 66 Boulevard Soult, Paris XIIIe.
 CALVINO, Dr. MARIO, Director of the Stazione Sperimentale di Floricoltura, San Remo, Italy.
 CARPENTER, Prof. G., B.Sc., Manchester Museum, The University, Manchester.
 CARR, Emeritus Prof. the Rev. J. W., M.A., F.L.S., Mapperley Edge, Private Road, Nottingham.
 COLLINGE, Dr. W. E., F.S.A., The Yorkshire Museum, York.
 CORREVON, Dr. H., Jardin d'Acclimatation, Geneva.
 DA SILVA, J. ERNESTO, 100 Calçada de Santo André, Lisbon.
 DE VRIES, Prof. HUGO, D.Sc., F.R.S., Lunteren, Holland.
 DE WILDEMAN, E., Directeur Honoraire du Jardin Botanique de l'Etat, Brussels.
 DIELS, Dr. L., Director, Botanic Garden, Berlin-Dahlem.
 EBBLEWHITE, E. A., LL.D., J.P., F.S.A., 5 Essex Court, E.C. 4.
 FEDTSCHENKO, Prof. BORIS, Jardin Botanique Principal, Leningrad, U.S.S.R.
 GENTIL, LOUIS, 35 Avenue de l'Arbalète, Boitsfort, Belgium.
 GIBALT, GEORGES, 64 rue de Grenelle, Paris.
 GUSSOW, H. T., LL.D., F.L.S., F.R.S. (Can.), Dominion Botanist, Central Experimental Farm, Ottawa, Canada.
 HALL, Rev. J. BERNARD, M.A., Preston Rectory, Lavenham, Suffolk.
 HANBURY, CECIL, M.P., F.L.S., La Mortola, Ventimiglia, Italy.
 HANDEL-MAZZETTI, Dr. H., Custos an der Botanischen, Abteilung des Naturhistorischen Museum, Vienna.
 HENNESEY, EUGENE J., B.A., B.Sc., High Mead, Kanes Hill, West End, Southampton.
 HOYT, Mrs. A. SHERMAN, Hillcrest, Buena Vista Av., S. Pasadena, California.

- IZQUIERDO, SALVADOR, Moneda 778, Santiago, Chile.
- KRELAGE, ERNST H., 6 Stolbergstraat, Haarlem, Holland.
- KRICHAUFF, The Hon. FREDERICK, Agricultural Bureau, Adelaide, S. Australia.
- LOCKIE, GEORGE, Botanic Gardens, King William's Town, S. Africa.
- MAY, H. B., V.M.H., Pteris House, 6 Endlebury Road, Chingford, E. 4.
- MOORE, Sir FREDERICK W., M.A., F.L.S., V.M.H., Rathfarnham, Co. Dublin.
- NEWSTEAD, Emeritus Prof. R., M.Sc., F.R.S., A.L.S., F.R.E.S., St. Mary's Cottage, 67 Handbridge, Chester.
- POLE-EVANS, Dr. I. B., C.M.G., M.A., F.L.S., Irene, Transvaal, S. Africa.
- POTTER, Rev. M. C., M.A., Sc.D., F.L.S., Corley Croft, New Milton, Hants.
- PRAIN, Lt.-Col. Sir DAVID, C.M.G., C.I.E., LL.D., F.R.S., F.L.S., V.M.H., The Well Farm, Warlingham, Surrey.
- RAMSBOTTOM, J., O.B.E., M.A., F.L.S., British Museum (Natural History), Cromwell Road, S.W. 7.
- RENDLE, A. B., M.A., D.Sc., F.R.S., F.L.S., V.M.H., Talland, The Mount, Fetcham Park, Leatherhead.
- SALMON, Prof. ERNEST S., F.L.S., South-Eastern Agricultural College, Wye, nr. Ashford, Kent.
- SCHNEIDER, Dr. C. K., Botlvarallee 9, J9 Heerstrasse, 4591, Berlin-Charlottenburg 9.
- SIRKS, Dr. M. J., Wageningen, Holland.
- SKOTTSBERG, Prof. C. J. F., Göteborgs Botaniska Trädgård, Sweden.
- SMITH, G. W., O.B.E., Strathclyde, Barbados, West Indies.
- TANAKA, Prof. TYOZABURO, Taihoku Imperial University, Taiwan, Japan.
- TAROUCA, Count E. SILVA, Schloss Pruhonitz, near Prague, Czechoslovakia.
- TETS VAN GOIDSCHALXOORD, Jonkheer G. F. VAN, Huize't Valckenbosch, Zeist, Holland.
- THE MASTER OF THE WORSHIPFUL COMPANY OF FRUITERERS, c/o The Clerk of the Company.
- THE MASTER OF THE WORSHIPFUL COMPANY OF GARDENERS, c/o The Clerk of the Company.
- TSCHERMAK-SZESENEGG, Prof. Dr. ERICH, Hochschule für Bodenkultur, Vienna.
- VAN SLOGTEREN, Prof. Dr. EGBERTUS, Laboratorium voor Bloembollenonderzoek, Lisse, Holland.
- VANWIJNGAERDEN, A., Directeur de l'Ecole d'Horticulture de l'Etat, Vilvorde, Belgium.
- VAVILOV, Prof. Dr. N. I., Director of the Institute of Plant Industry, 44 Rue Herzen, Leningrad, U.S.S.R.
- VOELCKER, J. A., C.I.E., M.A., Ph.D., F.I.C., F.L.S., 1 Tudor Street, E.C. 4.
- VOLLBRACHT, ADOLF, Austrian Hort. Society, 12 Parkring, Vienna.
- WALLACE, R. HEDGER, Mountserratt, Rodborough, nr. Stroud.
- WALLER, ERNEST, Emsallah, Tangier, Morocco.
- WORSDELL, W. CROSFIELD, 57 Cresswell Road, East Twickenham, Middlesex.
- WORSLEY, A., J.P., Mandeville House, Isleworth.
- ZAWODNY, M. le Docteur JOSEPH, 105 Moldantein, Czechoslovakia.

ASSOCIATES OF HONOUR

Established in 1930 and conferred on Persons of British nationality who have rendered distinguished service to Horticulture in the course of their employment. The number of Associates of Honour may not exceed 100 at any one time.

- 1933 ALEXANDER, JOHN, Niddrie Gardens, Craigmillar, near Edinburgh.
- 1933 ALLAN, DONALD, c/o Dobbie's Seed Farms, Marks Tey, Essex.
- 1931 ANDERSON, T. W., c/o Laxton Bros, 63 High Street, Bedford.
- 1931 ANDREWS, A., Park Superintendent's Office, Municipal Offices, Plymouth.
- 1930 ASHMORE, A. J., 10 Desenfans Road, Dulwich, S.E. 21.
- 1932 BAKER, W. G., Botanic Garden, Oxford.
- 1930 BANKS, G. H., Glasgow Botanic Gardens, Glasgow.
- 1934 BARRON, F. S., c/o R. H. Bath, Ltd., Floral Farms, Wisbech, Cambs.
- 1933 BEATTY, T., 175 Myland Road, Colchester.
- 1930 BENBOW, J., The Manor House, Kingston Park, Dorchester.

- 1930 BENNETT, W., Superintendent, Marine Parks, South Shields.
 1931 BESANT, J. W., Department of Agriculture, Botanic Gardens, Glasnevin, Dublin, N.W. 3.
 1931 BLAIR, C., The Gardens, Preston House, Linlithgow.
 1931 BLAIR, P. C., Hogart, Trentham, Stoke-on-Trent.
 1930 BLISS, D., V.M.H., Parks Department, 4 Mount Street, Swansea, Glam.
 1934 BRAGGINS, S. W. MACLEOD, La Mortola, Ventimiglia, Italy.
 1931 BREW, E. U., c/o Charlesworth & Co., Ltd., Orchid Growers, Haywards Heath, Sussex.
 1930 BROWN, T. W., Ministry of Agriculture, Horticultural Section, Giza (Mudiriya), Egypt.
 1931 BULLOCK, A., The Gardens, Copped Hall, Epping.
 1934 BURTON, Miss E. M., 3 Golf Course Road, Bonnyrigg, Midlothian.
 1931 CAMERON, J., The Gardens, Auchterarder House, Auchterarder, Perthshire.
 1930 CARPENTER, G., West Cottage, High Road, Byfleet, Surrey.
 1932 CHISHOLM, J. S., Edinburgh & East of Scotland College of Agriculture, 13 George Square, Edinburgh.
 1933 CHRISTIE, J. S., 424 Lordship Lane, E. Dulwich, S.E. 22.
 1933 CLARK, W. B., Superintendent, Links and Parks Department, Town House, Aberdeen.
 1931 COATES, A. W., The Gardens, Wakehurst Place, Ardingly, Sussex.
 1930 COMBER, J., The Gardens, Nymans, Handcross, Sussex.
 1931 COOK, C. H., The Royal Gardens, Windsor.
 1930 COOK, T. H., The Royal Gardens, Sandringham, King's Lynn, Norfolk.
 1930 COOPER, E. W., c/o Sanders, St. Albans, Herts.
 1930 COUTTS, J., V.M.H., 43 The Green, Kew, Surrey.
 1932 CRAVEN, WILLIAM, 14 Bath Street, Weymouth.
 1931 DAVIDSON, J. J., The Gardens, Arden Craig, Rothesay, Bute.
 1932 GIBSON, E., 19 Helix Road, Brixton Hill, S.W. 2.
 1934 GINGELL, W. B., 26 Minard Road, Catford, S.E. 6.
 1930 GILES, W. F., 38 Redlands Road, Reading, Berks.
 1930 GUTTRIDGE, J. J., Chief Superintendent of Parks and Gardens, The Bridge, Sefton Park, Liverpool.
 1932 HALES, WM., A.L.S., Chelsea Physic Gardens, Chelsea, S.W. 3.
 1934 HARRISON, A.T., The Gardens, Training Centre, Jordanhill, Glasgow, W. 3.
 1930 HARROW, G., Gracefield, 27 Tudor Road, Kingston Hill.
 1930 HILL, JOHN, The Gardens, Duntreath Castle, Blanesfield, Stirlingshire.
 1930 HOLTON, R. H., c/o J. Cheal & Sons, Ltd., The Nurseries, Crawley, Sussex.
 1930 HONESS, W. H., Walhampton Gardens, Lympington, Hants.
 1932 HORWOOD, FREDERICK, M.M., Hillside, Picts Hill, Langport, Somerset.
 1931 HOSKING, A., Crossriggs, Poltimore Road, Guildford, Surrey.
 1933 INGRAM, G. J., Secretary, Gardeners' Royal Benevolent Institution, 92 Victoria Street, S.W. 1.
 1931 ISBELL, W., 16 St. Mark's Road, Bush Hill Park, Enfield.
 1934 JAMES, E. R., Iwerne, London Road, Reading, Berks.
 1931 JEARY, T. J. P., c/o George Monro, Ltd., 4 Tavistock Street, Covent Garden, W.C. 2.
 1930 JENKINS, W. A., Faceby, Stokesley, Yorks.
 1930 JOHNSON, W. E., 3 St. John's Street, Newton Abbot, Devon.
 1931 JONES, J., O.B.E., Morne Bruce, Dominica, Leeward Islands, British West Indies.
 1930 JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.
 1930 KETTLEY, A., c/o Blackmore & Langdon, Twerton Hill Nursery, Bath.
 1931 LANE, G. T., 83 Ennerdale Road, Richmond, Surrey.
 1930 LOGAN, W., c/o Perry's Hardy Plant Farm, Enfield, Middlesex.
 1931 LONG, E. P., Drax House, Orcheston St. George, Wilts.
 1932 LONG, F. R., Superintendent of Public Parks, St. George's Park, Port Elizabeth, Cape Province, Africa.
 1931 McDONALD, F. W., 172 London Road, Reading.
 1931 MACDONALD, J. V., The Gardens, Whetstone, Somerset Road, Edgbaston, Birmingham.
 1930 MACFIE, JAMES B., c/o Dobbie & Co., Ltd., Edinburgh.
 1932 MCINNES, DONALD, The Gardens, Glamis Castle, Glamis, Angus, Scotland.
 1931 MCINTOSH, D. F., c/o R. H. Bath, Ltd., Floral Farms, Wisbech, Cambs.
 1930 McLAREN, J., Superintendent, Golden Gate Park, San Francisco.
 1931 MACRAE, A., Superintendent, Parks and Cemeteries Department, 93 Commercial Street, Dundee.
 1931 MAITLAND, T. D., M.B.E., 20 Craiglockhart Terrace, Edinburgh.
 1932 MANN, PHILIP, 1 Stoke Road, Aylesbury, Bucks.

- 1932 MARKHAM, E., The Gardens, Gravetye Manor, East Grinstead, Sussex.
 1932 MARKHAM, H., The Gardens, Wrotham Park, Barnet, Herts.
 1930 MARLOW, W. J.
 1931 MATHEWS, J. W., National Botanic Gardens, Kirstenbosch, Claremont, S. Africa.
 1930 METCALFE, A. W., The Gardens, Luton Hoo, Luton, Beds.
 1930 MUDGE, E. C., c/o Barr & Sons, 11/13 King Street, Covent Garden, W.C.
 1933 MUSTOE, W. R., O.B.E., 70 Stag Leys, Ashstead, Surrey.
 1930 NEAL, E., The Gardens, Tilgate, Crawley, Sussex.
 1934 NOBBS, G., Osborne House Gardens, East Cowes, I. of W.
 1930 OLIVER, W., c/o John Forbes, Ltd., Buccleuch Nurseries, Hawick.
 1930 PAGE, W. H., The Gardens, Chardwar, Bourton-on-the-Water, Glos.
 1933 PERFECT, B. F., Gattin Park Gardens, Reigate, Surrey.
 1931 PRITCHARD, W. J., Philburn, Bucknall's Lane, Garston, nr. Watford, Herts.
 1930 PUDDLE, F. C., The Gardens, Bodnant, Tal-y-Cafn, Denbighshire.
 1933 RADLEY, S., c/o R. Veitch & Son, Ltd., The Royal Nurseries, Alphington, Exeter.
 1934 RAFFILL, C. P., Royal Botanic Gardens, Kew, Surrey.
 1930 ROGERS, J., Brooklyn, Villiers Road, Woodthorpe, Nottingham.
 1930 SCOTT, J. W., c/o Lowe & Shawyer, Ltd., The Nurseries, Eaton Bray, Dunstable.
 1930 SHILL, J. E., Orchid Department, Dell Park, Englefield Green, Surrey.
 1930 SILLITOE, F. S., M.B.E., 31 Priory Road, Kew, Surrey.
 1933 SMITH, SAMUEL, The Gardens, Penjerrick, Falmouth, Cornwall.
 1930 STREET, C., The Gardens, Floors Castle, Kelso, Roxburghshire.
 1930 TANNOCK, D., Superintendent, Reserves Department, Botanic Gardens, Dunedin, New Zealand.
 1932 TAYLOR, GEORGE, The Gardens, Bulstrode, Gerrard's Cross, Bucks.
 1932 TAYLOR, GEORGE M., Links Cottage, Longniddry, East Lothian.
 1932 TROUGHTON, FRANCIS, 1 Vernon Park, St. John's, Worcester.
 1933 TUCKER, S. W., The Gardens, Longford Castle, Salisbury, Wilts.
 1934 USHER, A. E., Ranston Gardens, Blandford, Dorset.
 1930 WEBSTER, C., The Gardens, Gordon Castle, Fochabers, Elginshire.
 1930 WESTON, J. G., Chatsworth Gardens, Bakewell, Derbyshire.
 1931 WILLIAMS, R. O., Economic Botanist, Department of Agriculture, Port of Spain, Trinidad, B.W.I.
 1932 WOOD, C. F., Park Lodge, Stangham, Handcross, Sussex.
 1930 WOODWARD, J. G., The Gardens, Barham Court, Teston, Maidstone.

FORMER ASSOCIATES OF HONOUR.

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|-----------------------------|--------------------------------|
| 1930 BEDFORD, A. (d. 1934). | 1932 JONES, J. (d. 1933). |
| 1930 BROWN, J. (d. 1930). | 1931 FATEMAN, T. (d. 1933). |
| 1930 BUSS, F. (d. 1930). | 1930 STEWART, L. B. (d. 1934). |
| 1931 HOARE, J. (d. 1932). | 1931 TAYLOR, T. W. (d. 1932). |
| 1930 HOWE, W. (d. 1930). | 1932 VASEY, A. E. (d. 1934). |
| 1930 IRVING, W. (d. 1934). | 1930 WAKELY, C. (d. 1932). |

AFFILIATED SOCIETIES.

Any horticultural, allotment, or cottage garden Society may become affiliated to the Royal Horticultural Society on payment of a subscription of one guinea. The privileges, among others, include two transferable tickets of admission to all the meetings announced in the Calendar and to the Society's Garden at Wisley, two copies of the Society's JOURNAL as issued, and a copy of the Society's Rules for Judging, the right to purchase at a discount many of the Society's publications, and at cost price the Affiliated Society's Medal and Medal Cards, to apply for a grant of a Banksian Medal and Card, etc. etc.

Fellows are asked to bring to the notice of local Societies the great privileges conferred by affiliation; full particulars, together with an application form, can be obtained by applying to the Secretary.

MEETINGS. (See Calendar, pp. 1-7.)

A meeting and exhibition are held usually at fortnightly intervals in the New Hall in Greycoat Street, Westminster, and sometimes the Old Hall in Vincent Square is occupied as well.

There are also special meetings for the Daffodil Show, the Early Market Produce Show, the Great Spring Show at Chelsea, the Amateurs' Show, the Great Autumn Show at Olympia, and the Fruit and Vegetable Show.

The times during which the Shows are open are shown in the Calendar, and Fellows are particularly asked to note that, in order to meet the convenience of those who cannot attend the meetings during ordinary working hours, the two-day meetings are open on the first day until 7.30 P.M.

At these meetings there are exhibitions of Flowers, Fruits and Vegetables, to which all horticulturists are invited to contribute. The arrangements for showing are briefly set out in the section dealing with the Committees and their work (pp. 34, 37), and at all these meetings Committees appointed for the purpose make recommendations for Awards (p. 29) to the plants before them.

Sundries of a horticultural nature are exhibited at the meetings in December and January, and if space permits on November 27, and at the Great Spring and Autumn Shows; Pictures, Models and Plans of Flowers and Gardens are also admitted to the Shows in November, December, January and February. In 1935 there will be a special Show of Pictures on October 15 and 16. Full particulars can be obtained on application to the Secretary.

LECTURES.

Lectures on subjects of horticultural interest are given at the fortnightly meetings at 3.30 P.M., as indicated in the Calendar, and in addition four discussions have been arranged for those especially interested in Lilies and their allies (see Lily Group below), and one on March 19 for those especially interested in Daffodils (see Calendar).

CONFERENCES.

Conferences on (1) Daffodils have been arranged in connexion with the Daffodil Show in the New Hall on April 16 to 19, and on (2) Cherries and Soft Fruits in connexion with the fortnightly meeting on July 16 and 17. The discussions at these Conferences will be published. Full particulars can be obtained on application to the Secretary.

LILY GROUP.

The Lily Group consists of Fellows and Associates of the Royal Horticultural Society who are especially interested in Lilies, *Nomocharis* and *Fritillaries*. Its object is to provide Members with facilities for meeting to exchange views upon these plants. Membership is open to all Fellows and Associates without additional subscription.

Those who wish to join should apply in writing to the Secretary, who notifies Members by post of all meetings. Upon the recommendation of the Lily Committee the Council has arranged five meetings for 1935. The dates and subjects to be discussed will be found in the Calendar. Each discussion will be introduced by one or more speakers who have made a special study of the subject, and thereafter the discussion will be open. All Members are cordially invited to take part, and to bring plants, cut blooms, photographs or lantern slides bearing upon the subject under discussion. Inquiries from beginners will be welcomed.

THE LINDLEY LIBRARY.

Trustees : The Society acting by its Council.

Keeper : F. J. CHITTENDEN, F.L.S., V.M.H. Asst. Lib. : W. T. STEARN.

This Library now consists of more than 14,000 volumes and pamphlets, the latter being very important, and is registered as an " Outlier Library " of the Central Library for Students (see regulation 11).

The nucleus of the Library is the fine collection of books and pamphlets belonging to the late Dr. LINDLEY, so long and so honourably associated with the Society. Large additions have been received and are constantly being made both by donations and by purchases by the Society.

The original fittings and furnishings of the old Library, the generous gift of the late Sir HENRY SCHRÖDER, have been carefully removed and re-erected in the new Library on the third floor of the Offices of the Society in Vincent Square, and the cost of equipment of the stack room was presented by the Trustees of the Carnegie United Kingdom Trust Fund.

The Council confidently asks the assistance of the Fellows and of the general public in its endeavours to supplement the Library. Donations of money, and of horticultural and botanical books and horticultural trade catalogues are earnestly solicited, and may be sent to the Secretary, R.H.S., Vincent Square, S.W. 1.

LIBRARY REGULATIONS.

1. The Library is open daily (Sundays and holidays excepted) from 10 A.M. to 5 P.M. (Saturdays 10 A.M. to 1 P.M.). On two-day Shows at Westminster, it will be open until 6 o'clock on the first day of the Show.

2. The right of closing the Library at any time for purposes of re-arrangement, cleaning, etc., is reserved. It will be closed annually between the second and third fortnightly meetings of the Society in July, in order that the books may be cleaned and the stock inspected. For this purpose it is absolutely necessary that all books borrowed be returned on or before July 16. During the two weeks which follow Fellows will be able to consult books but not to borrow them.

3. Fellows of the Society have access to the Library at all times when it is open.

4. Gardeners and others, not Fellows or Officers of the Society, must make application to the Secretary for permission to use the Library, and must enter their names and addresses in a book provided for that purpose.

5. Anyone requiring the loan of a book to be taken from the Library must make written application to the Secretary, and loans will be granted on the following conditions, viz. :—

- (a) That the borrower be personally known to one or more of the Officers of the Society, or produce satisfactory references.
- (b) That the borrower sign a receipt for the volumes in a book provided for the purpose, before removing them from the premises, or if unable to attend, acknowledge the receipt by post ; and undertake to restore the books in good condition and to comply with the regulations.
- (c) That not more than three volumes be lent to one person at one time.
- (d) That borrowers through the post pay the postage both ways.

6. A certain discretion will be used as to what books shall be lent, but rare books which it would be difficult to replace, periodicals, expensive illustrated works and works of reference which are likely to be in frequent requisition within the Library itself may not be removed from the premises.

7. No books may be sent to Fellows resident abroad.

8. All books borrowed must be returned to the Library in good condition within one calendar month from the date of issue, and if sent by post must be properly protected and packed, but an extension of time may be granted on application.

9. The Secretary is empowered to demand of the borrowers such books as are detained beyond the prescribed time, and to take such steps as may be necessary to secure the prompt return of the same.

10. The loss of any book or any damage must be made good by the borrower.

11. Fellows requiring books on loan from the " Outlier " Libraries should make written application either to the Secretary of the Society or to the National Central Library for Students, Malet Street, London, W.C. 1.

12. The Trustees reserve the right of repealing or altering any of these regulations from time to time as may be required.

LIBRARY CATALOGUE.

The catalogue of the Library up to 1927 is now available. Price 5s. Orders should be placed with the Secretary.

PRIVILEGES OF CHEMICAL ANALYSIS.

Analyses of soils, manures, water, etc., are made by the Society's Consulting Chemist, Dr. J. AUGUSTUS VOELCKER, M.A., F.I.C., 1 Tudor Street, New Bridge St., London, E.C., at a reduced rate for

Fellows who are not engaged in any horticultural trade or in the manufacture or sale of any substance sent for analysis, and for Affiliated Societies. Full particulars of fees, methods of sampling, etc., can be obtained of the Secretary.

PUBLICATIONS.

The Society's publications include the JOURNAL, now issued to all Fellows monthly, containing an account of the Society's activities, lectures delivered at the fortnightly meetings, articles on horticultural matters specially contributed, descriptions and notes on plants to which awards have been made, accounts of work at Wisley, etc.

CURTIS'S BOTANICAL MAGAZINE, publication of which began in 1787, containing hand-coloured illustrations, descriptions and notes on new plants or plants recently introduced to gardens from abroad, published quarterly, price £3 3s. per annum. The INDEX LONDINENSIS, an index of all illustrations of flowering plants and ferns published between 1753 and 1921, in six volumes, price £5 5s. a volume. A supplement including illustrations up to the end of 1935 is in preparation.

An Index to the Society's JOURNAL from 1834 to the present time is also being printed and will be published in due course.

The LILY YEAR BOOK, price 5s. in paper, 6s. in cloth, is published annually in autumn, and the DAFFODIL YEAR BOOK, price 5s. in paper, 6s. in cloth, appears in summer.

Reports of the Society's Conferences, the latest being the report of the Conference on Apples and Pears at the Crystal Palace, entitled Apples and Pears : Varieties and Cultivation in 1934, are also published from time to time, and numerous Pamphlets and Books and Lists. A full list can be obtained on application to the Secretary.

FELLOWS' TICKETS.

Fellows are particularly requested to observe the rules of the Society governing the use of personal passes and transferable tickets. The personal passes must only be used by the Fellows themselves ; a transferable ticket must be retained by the person to whom it has been lent during his or her visit to the particular Show. All personal passes and transferable tickets must be produced to the Society's officers on demand.

ADMISSION TO MEETINGS WITHOUT TICKETS.

Any Fellow who attends the Society's Meetings at its Halls without producing his ticket will be asked to pay the entrance money and sign his name in a special book. The entrance money will be refunded to him on written application to the Secretary.

GARDENERS' TICKETS FOR THE GREAT SPRING SHOW AT CHELSEA AND AUTUMN SHOW AT OLYMPIA.

Any gardener or employee in a private, public or botanic garden, nursery or seed establishment may obtain tickets at reduced prices for

the Great Spring and Autumn Shows, admitting on the Thursday of these Shows, on application direct to the Secretary, R.H.S., Vincent Square, Westminster, S.W. 1, not less than three days before the Show. All applications must be on the special forms which may be obtained from the Secretary.

KINDRED SOCIETIES' SHOWS.

The following Kindred Societies will be holding Shows in the Society's Hall on the dates given in the Calendar, and Fellows' tickets will admit: Alpine Garden Society, British Carnation Society, Rhododendron Association, Iris Society, British Delphinium Society, Cactus and Succulent Society, National Carnation and Picotee Society, British Gladiolus Society, London Gardens Guild, London Allotments and Gardens Shows Society, National Dahlia Society, and the National Chrysanthemum Society. The National Auricula and Primula Society and the London Viola and Pansy Society will stage their exhibits at the ordinary fortnightly meetings.

FORM OF BEQUEST.

I give and bequeath to the Treasurer for the time being of The Royal Horticultural Society, London, the sum of £ , to be paid out of such part of my personal estate as I can lawfully charge with the payment of such legacy, and to be paid free of legacy duty, within six months of my decease; the receipt of such Treasurer to be a sufficient discharge for the same. And I declare that the said legacy shall be applied towards [the general purposes of the Society].

ROYAL HORTICULTURAL SOCIETY'S HALLS.

When not in use by the Society, the Halls, Lecture Room and Committee Rooms may be hired at reasonable rates for any large gatherings, such as Exhibitions, Shows, Concerts, Bazaars, Meetings and Balls.

Copies of the regulations and terms for hiring the Halls and Rooms may be obtained on application to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1.

INFORMATION AND INQUIRIES.

Fellows may obtain information and advice from the Society as to the names of flowers and fruits, on points of practice, attacks of insects and fungi, and on other questions. All inquiries should be sent direct to the Secretary, R.H.S. Offices, Vincent Square, S.W. 1.

HOW TO SEND SPECIMENS FOR IDENTIFICATION.

When inquiring the name of a plant or a fruit, Fellows would greatly facilitate identification of the specimen by observing the following rules:

1. Send a good strong piece, bearing leaves and at least three blossoms. Cut the flowers in the bud stage or they will be over before

they arrive. It is rarely possible and never wise to name a plant from its leaf alone, and poor specimens with only one blossom make identification unnecessarily difficult.

2. Wrap in soft paper and then pack in moss or even damp grass. Do not use cotton wool. Specimens should not be pressed.

3. Give all the information you can respecting the specimens, including the size of the plant and the country of origin or natural habitat, if known. With a garden plant, say where it is growing, greenhouse or open, sun or shade, etc.

4. Of fruits, send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how they are grown, *e.g.* indoors or out, as cordons, bushes or standards, etc.

5. It is a convenience if specimens are sent so as to reach the office on the day before a Show day, as it is then possible to enlist the services of the experts on the Committees.

INSPECTION OF GARDENS.

Inspection of gardens belonging to Fellows is conducted by a thoroughly competent Inspector from the Society, who reports and advises at the following cost, *viz.* : a fee of £3 3s. for one day (or £5 5s. for two consecutive days), together with all out-of-pocket expenses. No inspection may occupy more than two days, save by special arrangement. Should two or more Fellows residing in the same district, with their gardens within easy reach of one another, desire to have the services of the Garden Inspector, arrangements will be made for such a combined inspection and the fee and expenses divided by consent of those concerned. Fellows wishing for the services of an Inspector are requested to give at least a week's notice and choice of two or three days, and to indicate the most convenient railway station and its distance from their garden. Gardens can only be inspected at the *written* request of the *owner*.

SALE OF EXHIBITS AT SHOWS.

The attention of Fellows is drawn to the Society's rule that nothing may be sold for removal during a Show. Misunderstandings with regard to this rule sometimes occur, and its strict observance is essential for the smooth running of the meetings.

THE SOCIETY'S GARDENS.

Presented by the late Sir Thomas Hanbury, K.C.V.O.

WISLEY COMMITTEE

*appointed under the Hanbury Trust Deed.**Trustees.*

C. R. SCRASE-DICKINS, M.A., D.L.
 CECIL HANBURY, M.P., F.L.S.
 [Vacant by death of Miss ELLEN
 WILLMOTT, V.M.H.]

R.H.S. Representatives.

PRESIDENT, *ex-officio*.
 TREASURER, *ex-officio*.
 C. T. MUSGRAVE, V.M.H.

[Trustees of the Wisley Gardens Endowment Fund.]

THE PRESIDENT AND COUNCIL OF THE SOCIETY.

An important part of the work of the Society is carried out at its gardens at Wisley. The Society has always maintained a garden for the practical side of its work: in its early days at Kensington, then at Ealing and Chiswick, and finally, in 1903, through the kindness of Sir THOMAS HANBURY the present gardens at Wisley, which were handed over to the Society in trust and which have since been considerably enlarged.

Director.

R. L. HARROW, V.M.H.

Keeper of the Laboratory.

M. A. H. TINCKER, M.A., D.Sc.,
 F.L.S.

Mycology.

D. E. GREEN, M.Sc.

Entomology.

G. F. WILSON, F.L.S., F.R.E.S.,
 N.D.H.

Botany.

N. K. GOULD.

Assistant for Trials.

F. C. BROWN.

Assistant for Fruit Experiments.

A. N. RAWES.

Chief Clerk.

W. D. CARTWRIGHT.

Keeper of the Garden.

R. FINDLAY.

*Superintendent of Floral
Department.*

W. J. BLAKEY.

*Superintendent of Fruit and
Vegetable Department.*

J. N. MCGOOGAN.

*Superintendent of Rock Garden
Department.*

J. I. W. WALL.

Artist.

A. J. WISE.

Caretaker and Engineer.

W. HOLMES.

The whole of the work at Wisley is under the control of the President and Council of the Society, whose object is to develop the garden in such a way that it will meet all the requirements of horticulture and serve not only for the enjoyment and instruction of Fellows, but also for the advancement of horticultural science.

Trials of plants, fruits, vegetables, and sundries are held annually with the object of discovering the best of their several kinds and varieties. At the same time the varieties are described and classified.

The laboratory provides accommodation for the work of the members of the staff and for the instruction of student gardeners who receive a thorough training in both the science and practice of gardening.

A prospectus of the School of Horticulture may be had on application to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1; or to the Director, R.H.S. Gardens, Wisley, Ripley, Surrey.

Practical demonstrations of garden operations are held at suitable seasons: see Calendar of Shows and Fellows' Tickets.

ADMISSION TO THE GARDENS AT WISLEY.

The gates will be open on week-days, including Bank Holidays (but Good Friday and Christmas Day excepted), from 10 A.M. to sunset, or to 7.30 P.M. (whichever is the earlier), and on Sundays from the first Sunday in April to the first Sunday in October inclusive, from 2 to 6 P.M.

Fellows of the Society, on showing their tickets, have free personal admission to the Gardens on all occasions when the gates are open.

Friends of Fellows will be admitted on presenting a Fellow's Transferable Ticket, which will admit three persons in all.

The public are admitted on week-days on payment of 2s. 6d. for adults, and 1s. for children under the age of 15 years; admission on Sundays is reserved for Fellows and their friends.

Children under the age of 15 years will not be admitted unless accompanied by an adult, who will be held responsible for their conduct while in the Gardens.

Members of affiliated Societies and of Horticultural and Scientific Institutions desirous of visiting the Gardens in parties will be afforded free admission on application to the Director of the Gardens by the responsible authority. Applications for such visits should be made at least 14 days in advance.

All other bodies desirous of visiting the Gardens in parties should apply to the Secretary of the Royal Horticultural Society, stating the number of the party and date of intended visit. Such parties will be required to pay 1s. per head, with a minimum of 10s., and must purchase tickets in advance.

No dogs or perambulators will be admitted. Parcels, baskets, etc., must be left at the gate.

HOW TO GET TO THE GARDENS.

The Gardens are situated at Wisley in Surrey, within a short distance of the main Portsmouth Road, about a mile on the London side of Ripley. They are distant about four miles from Byfleet and West Weybridge Stations, four from Effingham and Horsley, and five from Weybridge, all on the Southern Railway. Motors can always be hired from Mr. Howard at Byfleet Station (5s. each way), or from Messrs. Shanks, Weybridge (10s. each way).

Byfleet, West Weybridge, and Weybridge Stations are on the Southern Railway Main Line and are served by a convenient service of trains from Waterloo. There are connexions with Chertsey and Reading at Weybridge.

Effingham and Horsley Stations are served by a frequent service of electric trains from Waterloo and Guildford.

Cheap day tickets are issued from Waterloo to the above Stations as under :

<i>To</i>	<i>Return Fares.</i>		<i>On</i>
	<i>1st Class.</i>	<i>3rd Class.</i>	
Effingham Junction .	4s. 3d.	2s. 9d.	} Week-days and Sundays by all trains.
Horsley . . .	4s. 6d.	3s. 0d.	
*Weybridge . . .	3s. 9d.	2s. 6d.	
*West Weybridge .	4s. 3d.	2s. 9d.	
Byfleet . . .	4s. 6d.	3s. 0d.	

Available for return by any train on the day of issue.

An hourly service of omnibuses—Service No. 215 (Monday to Friday), and No. 20 (Saturday and Sunday)—runs along the Portsmouth Road between Kingston Omnibus Station, near Kingston Railway Station, and North Street, Guildford, and passes within 5 minutes' walk of the Gardens ; and other local services within about a mile.

Service Nos. 20 and 215 provide connexions with other services as under :

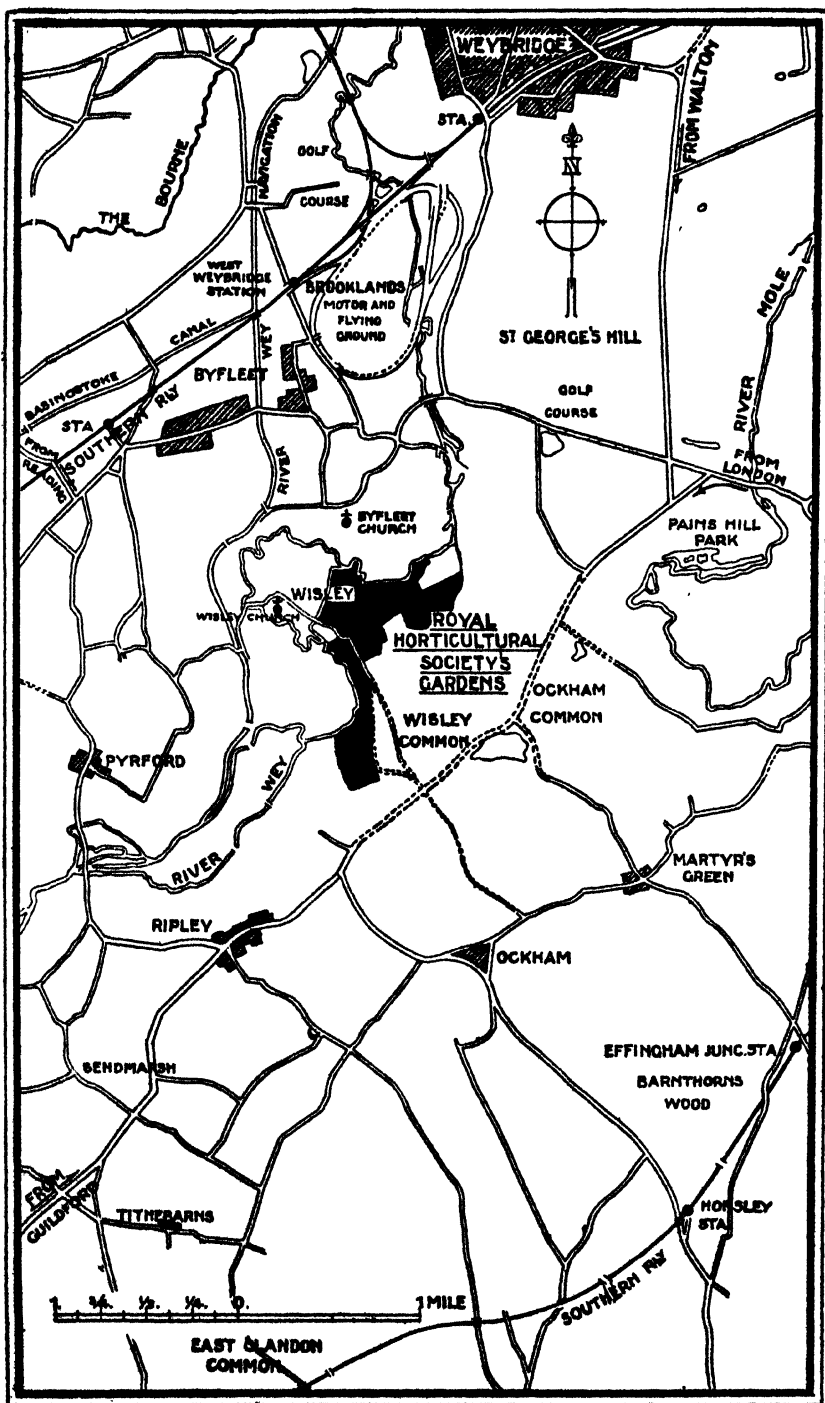
At Cobham (White Lion) with Service No. 462 for Stoke D'Abernon, Leatherhead, Weybridge, Addlestone, Chertsey, Staines, Wraybury, and Slough.

At Esher (Bear Hotel) with Service No. 217 for Hersham, Walton-on-Thames ; and Service No. 218 for Lower Halliford, Shepperton and Laleham.

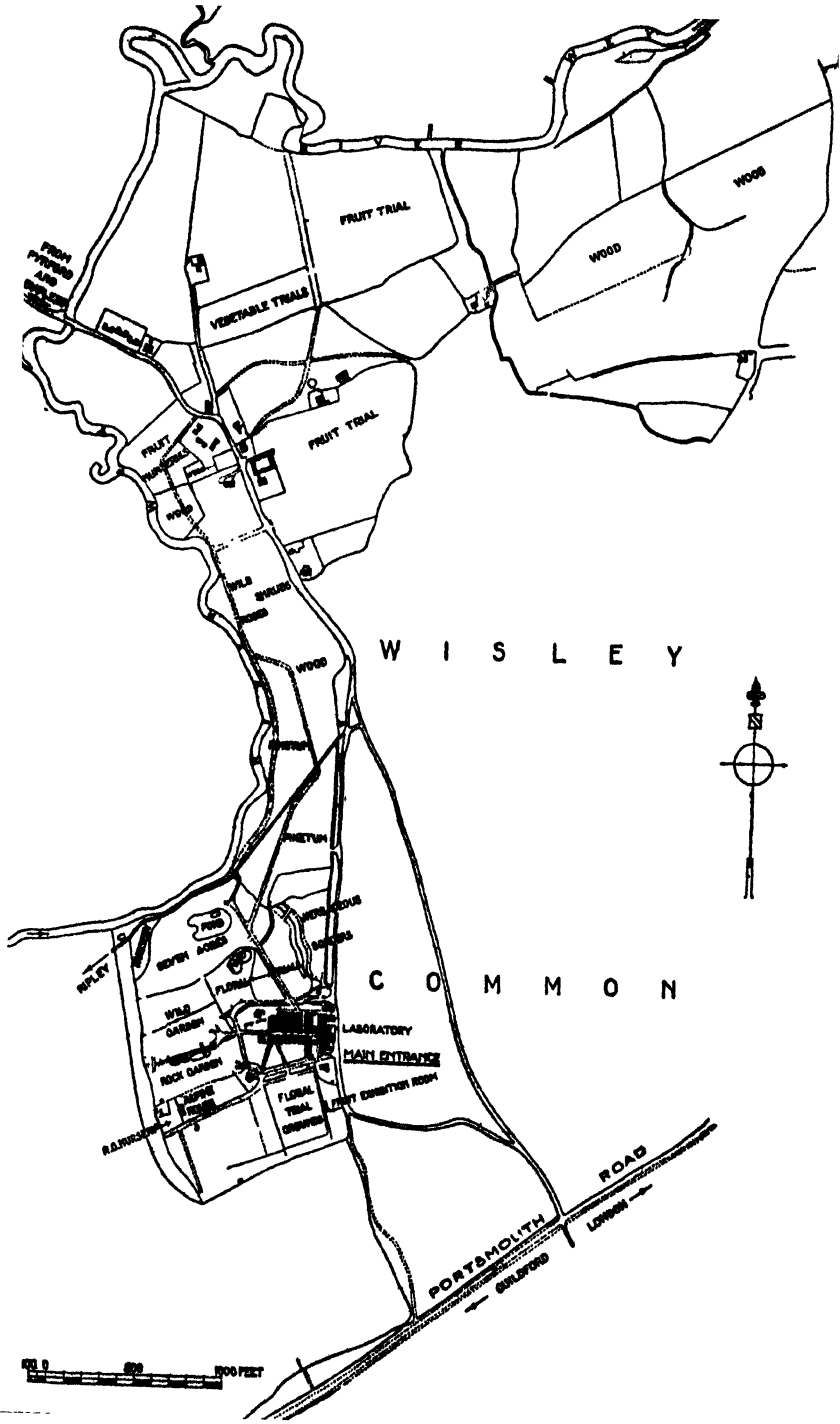
At Kingston Omnibus Station with Service Nos. 14 and 85 for Roehampton and Putney Bridge Station (District Line), and with Service No. 65 for Petersham, Richmond, Brentford, and Ealing.

At Ripley with Service No. 437 for Woking, Byfleet, Chertsey, Egham and Windsor.

From Guildford omnibuses run to all parts of Surrey.



WISLEY GARDENS.—ROUTE MAP.



PLAN OF THE SOCIETY'S GARDENS, WISLEY.

The "Green Line" also runs a half-hourly coach service between Guildford and Hertford, via Marble Arch. The coaches stop by request at the turning on the Portsmouth Road (5 minutes' walk).

For times the London Passenger Transport Timetables should be consulted.

As mentioned above, trials of Fruit, Vegetables and Flower are being continuously carried out, and these are based on a regular Calendar. The rules governing these trials at Wisley may be had on application to the Secretary, R.H.S. Offices, Vincent Square, S.W. 1, or to the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, to whom all articles for trial should be addressed. The Trials arranged for 1935-36 are as follows :

INVITED TRIALS, 1935.

TO BE JUDGED IN 1935.

VEGETABLES.

Maincrop Potatos	. 48 tubers of each variety to be sent by January 31.
Spinach . . .	. 1 oz. " " " " "
Savoy . . .	. 1 oz. " " " " "
Carrot . . .	. 1 oz. " " " " "
Beet . . .	. 1 oz. " " " " "

FLOWERS.

New Dahlias for certificate	. 3 plants of each to be sent by April 30.
New Delphiniums	" . 3 " " " " March 31.
New Gladioli for	" . 6 corms " " " "
Verbena	} One packet of each variety to be sent by January 31.
Petunia	
Coreopsis (Calliopsis)	
Viscaria	

PREPARATION FOR TRIALS IN 1936.

To prepare for the trials given in the Biennial Calendar, some of the seeds and plants are required sufficiently in advance to become established by the time appointed for their consideration by the Judges, namely :—

To be sent in 1935	For Judging in 1936.	Wallflowers	} One packet of each variety to be sent by April 30, 1935.
		Cornflowers	
		Schizanthus	One packet of each variety to be sent by June 30, 1935.
		Cabbage	1 oz. of each variety to be sent by June 30, 1935.

CALENDAR OF R.H.S. "INVITED TRIALS."

Flowers	1935.*	1936.*
	New Dahlias	New Dahlias
	New Delphiniums	New Delphiniums
	New Gladioli	New Gladioli
	New Irises	New Irises

* See above for quantities to be sent, and dates when they are required. Senders are urgently asked to consult the list which asks for certain plants, etc., to be sent a year or two in advance of that in which they will be judged.

CALENDAR OF R.H.S. "INVITED TRIALS."—*continued.*

	1935.*	1936.*
Flowers	New Sweet Peas Heucheras (plants now growing at Wisley) Verbena Coreopsis (Calliopsis) Viscaria Petunia	New Sweet Peas Asters—Annual double varieties Godetia Schizanthus Cornflower Wallflower
Vegetables	Spinach Savoys Potatos—Main Crop Carrots Beet Spreaders Edging Tools Hedge Clippers	Cabbage—Autumn sown Early Peas Dwarf French Beans Climbing French Beans
Sundries		

The Gardens themselves cover nearly 200 acres, and on general lines are laid out as shown on the plan on p. 24.

A section of the work at the Gardens of national importance is the trials of all kinds of hardy fruit for commercial planting. These trials are conducted under a Joint Committee of the Ministry of Agriculture and Fisheries, and the Royal Horticultural Society (see p. 53). They commenced in 1922, and after twelve years useful results are being obtained. Reports of the trials are published from time to time in the Society's JOURNAL.

DISTRIBUTION OF SURPLUS PLANTS.†

Every year in March surplus plants and seeds are distributed to those Fellows who apply for them. Of many varieties the stock is limited, and the application forms are therefore collected until the last day of February, and on and from February 15 are thrown into ballots and then drawn at random. The demands of each list are then satisfied as far as the available stock permits, and those Fellows who are disappointed by not receiving the plants for which they ask, must remember that there is no other method of treating all alike.

Fellows are asked to remember that the plants will necessarily be small and need careful handling when received. It is obvious that owing to their numbers the plants distributed could not be kept in the Gardens and grown on until they had reached a large size.

All application forms should be returned before the end of February, and no application can be entertained which is received after the end of April.

* See above for quantities to be sent, and dates when they are required. Senders are urgently asked to consult the list which asks for certain plants, etc., to be sent a year or two in advance of that in which they will be judged.

† These are plants which are surplus to the requirements of the Wisley Gardens, and as the Gardens become fully planted the number available may be diminished.

The Society does not pay the cost of packing and carriage. The parcels must be sent by post, the postage being prepaid by the Fellows themselves. Directions as to the amount of the remittance to be sent for this purpose will be found on the application forms for plants, and Fellows are requested to follow out these directions carefully.

Fellows residing beyond a radius of thirty-five miles from London are permitted to choose double the number of plants to which they would otherwise be entitled. Fellows residing abroad, subscribing one guinea per annum, are allowed twenty packets of seeds, and higher rates of subscriptions in proportion.

Fellows residing outside the United Kingdom and Ireland may apply for seeds on the list on the form provided, but plants cannot be sent to them owing either to difficulty of transport or to Government restrictions. Endeavour will, however, be made to procure for them to a reasonable extent any rare or unusual seeds which they cannot procure in the country where they live.

No plants will be sent to Fellows whose subscriptions are in arrear, or who do not fill up their forms properly.

EXAMINATIONS IN HORTICULTURE.

The Society conducts several examinations in horticulture, and the regulations and syllabus for any of them can be obtained by writing to the Secretary, R.H.S. Offices, Vincent Square, Westminster, S.W. 1.

The dates * for these examinations are given in the Calendar.

NATIONAL DIPLOMA IN HORTICULTURE.

Written Examinations: Preliminary, Final.

Practical Examinations: Preliminary, Final.

This is the highest examination in horticulture conducted by the Society, and was established in 1912, with the sanction of the Board of Agriculture, as a test of real professional ability.

Among those for whose benefit the Diploma was established are the following: Florists, Fruit Growers, Gardeners, Horticultural Inspectors, Horticultural Instructors,† Landscape Gardeners, Market Gardeners, Nurserymen, Public-Park Gardeners and Seedsmen.

The examination is designed to test, first, a candidate's practical knowledge and, secondly, his acquaintance with the principles underlying garden practice. The examiners will do their best to discourage "cramming," and to insist on practical experience. Books are valuable only when used intelligently to supplement experience.

* These dates are subject to alteration.

† This does not include a School Master or Mistress who is engaged in teaching other subjects in schools, but applies only to persons whose chief work in life is devoted to giving instruction in horticulture. The examination is for the horticultural profession only.

TEACHERS' EXAMINATIONS IN SCHOOL AND COTTAGE GARDENING.

Preliminary Examination : Written.

Advanced Examination : Written and Practical.

This examination is not exclusively confined to members of the scholastic profession, but is open to all candidates provided they can furnish a satisfactory certificate of having done practical work. Candidates in both the preliminary and advanced examinations must satisfy the examiners that they have had practical gardening experience.

GENERAL EXAMINATION.

General Examination for Seniors (18 years of age and over).

General Examination for Juniors (under 18 years).

This examination is held by the Royal Horticultural Society to assist the efforts of County Councils, Technical Institutes, Schools, Gardeners' Mutual Improvement Societies and other bodies to promote instruction in practical horticulture, and in the hope of rendering such instruction definite and effective.

BRITISH FLORAL ART DIPLOMA.

This examination was established in 1933 with the object of encouraging and stimulating interest in this craft by the establishment of a Diploma.

The examination is open to both men and women and will usually be held twice annually, in early spring and autumn ; the dates for 1935 are given in the Calendar.

There is no age limit, but the number of candidates accepted for each examination will be limited to fifty.

There are both practical and written examinations, and Diplomas will be awarded to successful candidates.

The examination is intended primarily for florists and florists' assistants, but is not confined to members of the florists' trade.

AWARDS AND MEDALS.

The following awards are made by the Council :—

CERTIFICATES.

The awards given to plants, flowers, fruits and vegetables are :—

1. **FIRST CLASS CERTIFICATE.**—Instituted 1859. Given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to plants, flowers, fruits and vegetables of great excellence.

2. **AWARD OF MERIT.**—Instituted 1888. Given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to plants, flowers, fruits and vegetables which show a sufficiently distinct advance on their predecessors.

3. **HIGHLY COMMENDED.**

4. **COMMENDED.**

These two Awards are given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to noteworthy plants, flowers, fruits and vegetables after trial at Wisley or elsewhere.

5. **PRELIMINARY COMMENDATION.**—Instituted 1931. Given at Shows on the recommendation of the Floral, Orchid, Narcissus and Tulip, and the Joint Committees to seedlings and new plants of promise.

6. **BOTANICAL CERTIFICATE.**—Instituted 1878. Given on the recommendation of the Scientific Committee to plants of botanical interest.

7. **AWARD OF GARDEN MERIT.**—Instituted 1921. Given on the recommendation of the Wisley Advisory Committee to plants which either are well known to the Council, Committees and Garden Staff, or have been tested and grown at Wisley in the same manner as they would have been grown in a private garden, and have proved to be excellent for ordinary garden or greenhouse use.

A plant that has received this award is not thereby precluded from receiving other awards.

The following awards are given to individuals :—

8. **CERTIFICATE OF APPRECIATION.**—Instituted 1908. Given on the recommendation of the Scientific Committee to persons whose work is of scientific interest from a horticultural point of view, or is such as may be reasonably expected to assist in the improvement of a strain or in creating a new break.

9. **CERTIFICATE OF CULTURAL COMMENDATION.**—Instituted 1872. Given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to growers whose exhibits show evidence of great cultural skill.

10. **CERTIFICATE OF DILIGENT INTEREST.**—Instituted 1910. Specially intended to encourage the upkeep of small gardens, plots and window boxes, and the cultivation of plants in pots by adults and children.

The following awards are given to Sundries after trial on the recommendation of the Wisley Advisory Committee :—

(a) **AWARD OF MERIT.**

(b) **HIGHLY COMMENDED.**

(c) **COMMENDED.**

MEDALS.

1. **THE LAWRENCE MEDAL.**—Instituted in 1906 to celebrate Sir Trevor Lawrence's twenty-one years' tenure of office as President of the Society. Awarded

directly by the Council annually for the best exhibit shown to the Society during the year. No exhibitor may receive this gold medal more than once in three years.

2. THE GOLD MEDAL.—Instituted in 1898. Re-designed in 1929. Awarded for exhibits of special excellence.

3. THE FLORA MEDAL.—Instituted in 1836. Awarded for exhibits of flowers and ornamental plants. Struck in bronze, silver and silver-gilt. At the Daffodil Show and at the Great Spring and Great Autumn Shows it is awarded in all grades, but at Fortnightly Shows awarded only in bronze and silver.

4. THE BANKSIAN MEDAL.—Instituted in 1820, in commemoration of Sir Joseph Banks, F.R.S., one of the founders of the Society. Awarded for exhibits of flowers and ornamental plants. Struck in bronze, silver and silver-gilt.

5. THE HOGG MEDAL.—Instituted in 1898 in commemoration of Dr. Robert Hogg, the great pomologist, sometime Secretary of the Society. Awarded for exhibits of fruit. Struck in bronze, silver and silver-gilt.

6. THE KNIGHTIAN MEDAL.—Instituted in 1836 in commemoration of Thomas Andrew Knight, F.R.S., President of the Society, 1811 to 1838. Awarded for exhibits of vegetables. Struck in bronze, silver and silver-gilt.

7. THE LINDLEY MEDAL.—Instituted in 1866 in commemoration of Dr. John Lindley, F.R.S., sometime Secretary of the Society. Awarded for exhibits of a plant or plants of special interest or beauty or showing exceptional skill in cultivation, and for educational exhibits. Struck in bronze, silver and silver-gilt.

8. THE GRENFELL MEDAL.—Instituted in 1919 in commemoration of Field-Marshal Lord Grenfell, President of the Society, 1913 to 1919. Awarded for exhibits of pictures, photographs or objects of a similar nature of horticultural or botanical interest. Struck in bronze, silver and silver-gilt.

9. THE WILLIAMS MEMORIAL MEDAL.—Instituted in 1896 by the Trustees of the Williams Memorial Fund in commemoration of B. S. Williams. Re-designed in 1927. Awarded directly by the Council for a group of plants and/or cut blooms of one genus which show excellence in cultivation. Fruit and vegetables are excepted. Two medals in gold are annually available for award.

10. THE SANDER MEDAL.—Instituted in 1923 and presented by the firm of Messrs. Sander & Sons in memory of H. F. C. Sander, F.L.S., V.M.H., the founder of the firm. Awarded to the exhibitor of the best new greenhouse plant shown to the Society during the year. Struck in gold.

11. THE GEORGE MOORE MEDAL.—Instituted in 1926 and presented by the late G. F. Moore, V.M.H. Awarded to the exhibitor of the best new Cypripedium shown to the Society during the year. Struck in gold.

12. THE HOLFORD MEDAL.—Presented by the Executors of the late Sir George Holford in 1928. Awarded for the best exhibit of plants and/or flowers (fruit and vegetables excluded) shown by an amateur during the year in the Society's Halls. Struck in gold.

13. THE SEWELL MEDAL.—Instituted in 1929 and presented by the late A. J. Sewell. Awarded for exhibits of plants suitable for the rock garden or alpine house. Struck in gold. In 1935 five medals are offered for award, two on March 19, two on June 18, and one on August 27. One medal is offered on each date for an amateur's exhibit, and on each of the first two dates one medal is also offered for a horticultural trader's exhibit. Each exhibit must consist of six pots or pans not exceeding 12 inches in diameter. Only one subject may be shown in each pot or pan. It is not necessary that the plants should have been grown in the receptacles in which they are shown and, if desired, plants may be lifted and potted for the purposes of the competition. Not fewer than four plants in each exhibit must be in bloom, and plants which are not in bloom should possess decorative value when shown. The scale of points for judging will be as follows: Suitability, 24 points; Rarity, 18 points; Cultivation, 24 points. Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than by the first post on the Wednesday preceding the show.

14. THE VEITCH MEMORIAL MEDAL.—Instituted in 1870 in commemoration of James Veitch of Chelsea. In 1922 the Veitch Memorial Trust was vested in the Council of the Society. Awards of medals and prizes are made annually to those who have helped the advancement of the science and practice of horticulture, and for special exhibits. Struck in bronze, silver and gold.

Any medal awarded at one of the Society's Meetings is awarded to the exhibitor and for a particular exhibit. The Award may not be advertised by anyone other than the exhibitor, and the exhibitor may only advertise the Award by using the terms of the Award card, i.e. by quoting the words, "for an exhibit of Begonias," or "for an exhibit of Delphiniums," or as the case may be.

The Council, having ascertained that the majority of firms who exhibit at the Society's Meetings do not desire to possess many medals of the same grade, has decided that the first time a trade firm is awarded a medal it will be forwarded, but no medal of the same grade will be sent afterwards unless application is made within a year from the date of the award. Medals will never be sent out unengraved.

CUPS.

CHALLENGE CUPS.

The following cups are offered for award at the Society's Meetings. A challenge cup, unless otherwise stated, will be held for one year by the winner, who will be required to give a guarantee for its return in good condition. The winner will receive a certificate recording his success and, except where a replica of the cup is supplied, his gardener will receive an appropriate silver Hogg, Knightian or Banksian Medal. The decision of the Council is final and any cup may be withheld at its discretion.

1. THE AFFILIATED SOCIETIES' CUP.—Founded in 1908 by the Society and offered for the best collection of fruit shown by an Affiliated Society in the special class at the Fruit and Vegetable Show on October 8, 1935. For conditions see special schedule.

2. THE CAIN CUP.—Presented by Sir Charles Nall-Cain, Bt. (Lord Brocket), in 1920. Offered for the best exhibit shown by an amateur at the Great Spring Show at Chelsea. Applications for space should be made on the form in the schedule. See also the Jubilee Trophy, p. 33.

3. THE CLAY CHALLENGE CUP.—Presented by Messrs. Clay in 1913. Offered for a rose of good form and colour, not in commerce before the current year, and possessing the true old rose scent, such as may be found in the old Cabbage or Provence Rose, in 'General Jacqueminot,' 'Marie Baumann,' 'Duke of Wellington,' 'General McArthur,' etc. The scent known as "tea rose" is not, for the purposes of this competition, to be counted the true old rose scent. Not more than three different varieties may be shown by one competitor. At least three and not more than six blooms or trusses of each variety will be required, together with a plant in flower and bud. The cup will be awarded only once for the same rose. Open for competition to trade and amateur growers at the Fortnightly Show on July 30, 1935. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

4. THE CORONATION CUP.—Founded in 1911. Offered in 1935 for the best exhibit at the Great Autumn Show at the National Hall, Olympia, on September 25, 26, and 27. Applications for space should be made on the form in the schedule.

5. THE ENGLEHEART CUP.—Founded in 1913 by the Society and offered at the annual Daffodil Show for one stem of each of twelve varieties raised by the sender. See special schedule.

6. THE FOREMARKE CHALLENGE CUP.—Presented by Sir Francis Burdett, Bt., in 1919. Offered for twenty spikes of named Gladioli in not less than ten varieties and not more than two spikes of any one variety. Open for competition to trade and amateur growers at the Fortnightly Show on August 13, 1935. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

7. THE GEORGE MONRO MEMORIAL CUP.—Presented in 1921 by Mr. George Monro and his brothers in memory of their father. Offered for the best exhibit of grapes shown by an amateur at the Fruit and Vegetable Show on October 8, 1935. The conditions of the competition will be found in the special schedule.

8. **THE GORDON-LENNOX CUP.**—Presented by Lord Algernon Gordon-Lennox in 1913. Offered for the most meritorious exhibit of fruit shown by an amateur at the Fruit and Vegetable Show on October 8, 1935. Conditions will be found in the schedule. The winner's gardener will receive a replica of the cup presented by Lady Algernon Gordon-Lennox.

9. **THE ORCHID CHALLENGE CUPS.**—Presented by the Orchid Trade. An exhibitor winning a cup three times retains the cup in perpetuity.

- (a) A CHALLENGE CUP for the best group of orchids exhibited at the Great Spring Show, Chelsea, by an amateur in a space not exceeding 100 square feet.
- (b) A CHALLENGE CUP for the best group of orchids exhibited at the Great Spring Show, Chelsea, in a space not exceeding 60 square feet by an amateur who employs not more than three assistants in the orchid houses, including the head gardener.

Any competitor may enter for either of the above cups, but not for both in any one year. Applications for space should be made on the form in the schedule.

- (c) A CHALLENGE CUP for the best group of orchids exhibited at the Fortnightly Show on October 15 and 16, 1935, in a space not exceeding 60 square feet, by an amateur who employs not more than three assistants in the orchid houses, including the head gardener. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

10. **THE R.H.S. VEGETABLE CHALLENGE CUP.**—Founded in 1910. Offered at the Fruit and Vegetable Show on October 8, 1935, to the competitor who secures the greatest number of first-prize points for exhibits of vegetables.

11. **THE SHERWOOD CUP.**—Presented in 1920 by the members of the Sherwood family in memory of N. N. Sherwood. Offered for award by the Council directly for the most meritorious exhibit at the Great Spring Show at Chelsea. Applications for space should be made on the form in the schedule.

12. **THE WIGAN CUP.**—Presented by Mr. A. L. Wigan in 1911. Offered in 1935 for the best exhibit of roses shown at the Great Autumn Show at the National Hall, Olympia, on September 25, 26, and 27. Applications for space should be made on the form in the schedule.

CUPS AND TROPHIES TO BE WON OUTRIGHT.

13. **THE REGINALD CORY CUP.**—Founded in 1923 by Reginald Cory, and presented annually by Mrs. R. Cory. The cup is given with the view of encouraging the production of hardy hybrids of garden origin, and will be awarded only to the raiser of a plant that is the result of an intentional cross. Only a hybrid of which one parent is a true species is eligible, and it must have been exhibited at one of the Society's Shows during the current year. Hybrids of annuals and biennials do not come under the scope of the award.

14. **A SILVER CUP FOR DAFFODILS.**—Messrs. Barr & Sons, Ltd., offer a silver cup at the Daffodil Show, April 16 and 17, 1935, to the competitor who obtains the highest total number of prize-points in the single bloom classes for amateurs. (See special schedule.)

15. **ORCHID TROPHIES,** presented by the Orchid Trade for competition at the Great Spring Show at Chelsea in 1935.

- (a) A Silver Trophy for the best twelve orchids, not more than two of any one genus, exhibited by an amateur who employs not more than two growers, including the head gardener, in his orchid houses.
- (b) A Silver Trophy for the best six orchids exhibited by an amateur who employs not more than one orchid grower or gardener.

Applications for space should be made on the form in the schedule.

Two similar trophies, presented by the Orchid Trade, are offered for competition under the same conditions at the Fortnightly Show on October 15 and 16, 1935. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

16. **THE RIDDELL TROPHY FOR VEGETABLES.**—A silver trophy is provided each year from a fund established in 1931 by Lord Riddell for the

encouragement of the cultivation and exhibition of vegetables. In 1935 the trophy is offered for award in the class for a table of vegetables at the Fruit and Vegetable Show. (See special schedule.)

17. THE SUTTON VEGETABLE CUPS.—Messrs. Sutton & Sons, Ltd., present annually two cups for vegetables.

One is offered for award for the best group of vegetables shown by an amateur at the Great Spring Show at Chelsea. (See special schedule.)

The other is offered for the best exhibit of twelve distinct kinds shown by an amateur in the special class at the Fruit and Vegetable Show. (See special schedule.)

18. A SILVER CUP FOR AURICULAS.—Mr. K. D. Corsar has presented a silver cup to be offered for award at the Fortnightly Show on April 24 and 25, 1935, to the amateur who exhibits the best twelve varieties of show Auriculas; not fewer than two green-edged, two grey-edged, two white-edged, and two self-coloured varieties; not more than one plant of any variety, and no plant to have more than one truss. Entries must be made on special forms, which may be obtained from the Secretary, by whom the completed forms must be received not later than by the first post on Wednesday, April 17.

19. A SILVER TROPHY FOR CACTI AND SUCCULENTS.—A silver trophy provided from Mrs. Sherman Hoyt's Prize Fund is offered for the best group of cacti and/or succulents staged on a table space with a frontage of 6 feet and a depth of 3 feet at the Amateurs' Flower Show on June 25, 1935. (See special schedule.)

20. THE NEW YORK HORTICULTURAL SOCIETY'S CUP.—A silver cup presented by the Horticultural Society of New York is offered for award for the best exhibit of trees and shrubs staged in the open at the Great Spring Show at Chelsea in 1935. Applications for space should be made on the form in the schedule.

21. THE JUBILEE TROPHY.—To celebrate the 25th anniversary of His Majesty's accession to the throne, a silver trophy is offered for award for the best exhibit shown by an amateur at the Great Spring Show at Chelsea in 1935. The winner of this trophy will also receive the Cain Cup. The trophy will be accompanied by a prize of £20 for the exhibitor's gardener. Applications for space should be made on the form in the schedule.

THE JONES-BATEMAN CUP.

Presented by Miss L. Jones-Bateman of Cae Glas, Abergelle, in 1920, for the encouragement of fruit production. Offered triennially for original research which has added to our knowledge of cultivation, genetics, or other matters relating to fruit growing. The cup is held by the winner for three years, and on being relinquished the holder receives the Hogg Medal in gold. Particulars of competition may be obtained on application to the Secretary. The Cup is available for competition in 1935.

THE LODER RHODODENDRON CUP.

Presented in 1921 by Mr. G. W. E. Loder (Lord Wakehurst) in memory of his brother, Sir Edmund Loder, Bt. The cup will be awarded annually, but not more than once in seven years to the same individual. In awarding it the judges will consider, not merely floral display, but the value to horticulture of the work of the recipient, whether such work shall include the production of flowers or not. Of the five judges, three will be appointed by the Royal Horticultural Society and two by the Rhododendron Society. The award will be made in October of each year. The cup is held by the winner for one year.

PETER BARR MEMORIAL CUP.

Presented in 1912 by the Trustees of the Peter Barr Memorial Fund in commemoration of Peter Barr, V.M.H. Awarded every year on the recommendation of the Narcissus Committee to anyone who in the Committee's opinion has done good work of some kind in connexion with daffodils. The cup is held by the winner for one year.

EXHIBITIONS : GENERAL NOTES.*

Shows have been arranged for the dates given in the Calendar, but the Council reserves the right to alter the list in any way that may from time to time seem to be for the interest of the Society. All persons, whether Fellows of the Society or not, unless excluded by some special regulation, are invited to exhibit. Schedules containing special regulations are issued for the Daffodil Show, the Great Spring Show at Chelsea, the Early Market Produce Show, the Amateurs' Flower Show, the Great Autumn Show at the National Hall, Olympia, and the Fruit and Vegetable Show.

Those who desire to exhibit at a Fortnightly Meeting at the Halls must give notice in writing to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1, not later than by the first post on the Wednesday before the Meeting at which they wish to exhibit, stating the nature of the proposed exhibit and how much space it will occupy. Entry forms may be obtained from the Secretary, and exhibitors are requested to use them. Letters will be sent to exhibitors on the Wednesday before the Meeting, informing them what space has been allotted. If no letter is received by the Friday before the Meeting the exhibitor should at once communicate with the Secretary. There are no entry fees, nor are there any charges for space or staging for exhibits of plants, flowers, fruit, vegetables, pictures, plans, or models. A charge is made for space for exhibits of horticultural sundries at the Great Spring Show at Chelsea and at the Great Autumn Show at the National Hall, Olympia, but not at the Halls. The Council reserves to itself the right to refuse any application for space, and, in the event of any such refusal, it is not to be required to give any reason or explanation. The allotment of space, both as regards area and position, will be in accordance with the discretion of the Council, and exhibitors must be content to abide loyally by its decision.

Fellows are specially invited to exhibit interesting or well-grown plants, flowers, fruit or vegetables, and any Fellow who desires to stage an exhibit of not more than three pots, vases, or dishes may do so at any Fortnightly Meeting, although he has not applied for space beforehand. Such exhibits must be entered with the clerk at the Small Exhibits Table by noon on the morning of the Meeting, and he will provide exhibitors' cards and stage the exhibits. Exhibitors are not permitted to place on this special table any notices or leaflets, nor may any orders be booked there. Exhibits staged under this regulation may be considered for Certificates of Cultural Commendation.

The Society's officers will, if necessary, unpack and stage small

* A copy of the complete regulations for exhibitions will be sent on application to the Secretary.

exhibits if the Secretary has been notified beforehand of their coming and of the owner's inability to accompany them, but in no case can the Society undertake or be responsible for their repacking or return. All parcels sent by rail or post must be sent carriage paid and at the risk of the sender, addressed to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1. A separate notification must be sent by post at the same time.

Exhibitors may, generally, begin staging at 2 P.M. on the day before a Fortnightly Meeting and continue until 10 P.M., when the lights will be turned out and the Hall closed. After 10 P.M. no goods can be admitted until the next morning. Staging may be resumed at 6.30 A.M. on the day of the Meeting, and all exhibits must be ready for inspection by 11.30 A.M. At special Shows exhibits must be ready for inspection by the time given in the particular schedule. Vases, 6 inches and 9 inches in height, are provided by the Society. Exhibitors are at liberty to borrow them in return for a deposit of 2s. 6d. a dozen, which is refunded when the vases are returned in good order at the end of the meeting. White plates, 10 inches in diameter, may be borrowed from the Society by exhibitors free of charge.

Every exhibit (except pictures, plans, photographs, models and horticultural sundries) must be entered with the Secretary of one or other of the Committees (see pp. 41-53), viz. : the Fruit and Vegetable, the Floral (which deals with flowers, foliage plants, trees and shrubs), the Orchid, the Narcissus and Tulip, or the Scientific Committee. Exhibits intended for one Committee may not be mixed with those intended for another. Fruit and vegetables may not be combined in one exhibit, and flowers may not be mixed with either, but foliage, such as that of asparagus, or small ferns, may be placed between the dishes. Tomatos rank as vegetables. Decorative vegetables, such as coloured kales, must be shown as vegetables and not mixed with flowers. Table decorations, bouquets, wreaths and sprays of flowers are excluded. Plants and produce exhibited to show the effect of different manures and soils are considered to be sundries and may only be exhibited as such. Mushroom spawn may be shown, but only among the sundries. Neither artificial nor dyed or surface-coloured flowers or foliage may be exhibited. No dormant bulbs or corms, and no plants ordinarily grown for their flowers or fruits, but not in flower or fruit, can be admitted to the Society's Meetings, unless specially permitted by the regulations or as horticultural sundries. Miniature gardens (other than "trough gardens" used for the cultivation of alpine which are difficult to grow) may only be shown as sundries.

Pictures and photographs of plants, flowers, and gardens, and plans and models of gardens, may be exhibited at the Society's fortnightly shows during November, December, January and February. Only works which are definitely of horticultural or botanical interest are invited. Paintings of flowers should be at least life-size ; miniatures are unsuitable for the Society's exhibitions. Pictures executed in

needlework or modelled in paper, and all fanciful or fancy-work objects, pictures, calendars, Christmas cards and similar objects are also unsuitable and may not be shown. Sundries may be shown in the Halls during December and January. As in 1935 there is only one show in December, sundries will be admitted on November 26, if space permits. Sundries may also be exhibited at the Great Spring Show at Chelsea, and at the Great Autumn Show at the National Hall, Olympia. Only sundries of a distinctly horticultural nature may be shown. Neither raffia in the form of dolls or other fancy figures, pot-pourri, scent, ladies' smocks, nor embroidered or other fancy aprons are regarded as horticultural.

Only actual exhibitors, and such assistants as may be necessary for the arrangement of the exhibits, will be admitted before the exhibition is opened to the public. All persons, except such as may be retained by the Society, must retire at the time fixed for judging. Exhibitors' passes will be issued when necessary. Photographs may be taken at the Society's exhibitions only by those holding photography permits issued by the Secretary. Smoking is strictly prohibited in the Halls during the hours of the exhibitions.

After judging has taken place, nothing exhibited may be altered or removed until the close of the Show, except by permission of the Secretary. This does not apply to faded flowers, which should be replaced. Nothing exhibited may be removed from the Meetings until after the time of closing without special permission in writing. Exhibitors are forbidden to sell plants, flowers, fruit, vegetables or other articles for removal during the Meeting. The door-keepers have instructions to see that this rule is observed. In order not to deter the owners of new or special plants from submitting them to the Committees for award, the Council has decided that written application may be made to the Society for leave to remove such plants at 5 P.M. on the first day of any two-day Meeting at the Society's Hall. The Council hopes that sparing use will be made of this privilege, and that application will be made only in cases of urgent necessity. Nothing may be removed from an exhibit under this regulation until the written application has been signed by the Secretary. All goods must be removed from the Halls by 9 P.M. on the evening when the Show closes, unless special arrangements have been made with the Secretary. Anything left on the premises remains there at the owner's sole risk.

All exhibits, personal property, etc., shall be at the risk of the exhibitors, and the Society shall not be liable for compensation for loss or damage by theft, fire, water, accident, the requirements of the London County Council, or any other cause whatsoever. Should a Show from any cause not be held, no exhibitor shall have any claim on the Society or its officers for loss, damage, interest, or compensation. Exhibitors will be wholly responsible for any claim made by their employees under the Employers' Liability Acts or the Workmen's Compensation Act, etc. The Society has no responsibility to any but its own employees.

THE COMMITTEES AND THEIR WORK.

COMMITTEES are appointed annually to meet in connexion with the Society's Shows and other activities. Some are nominated entirely by the Council, while others are appointed jointly by the Council and the governing bodies of allied societies. One of the principal objects of these Committees is to encourage the introduction of new species of plants and the production of new and improved varieties of decorative plants, flowers, fruits and vegetables, by examining and reporting upon such as may be submitted either at exhibitions or for trial. Awards are made by the Council to meritorious objects upon the recommendations of these Committees. Another function of the Committees is to collect and disseminate information about plants, flowers, fruits, vegetables and other objects of horticultural interest, including information regarding the classification and nomenclature of garden plants, and the incidence and control of diseases and pests. Certain Committees report upon the merits of non-competitive exhibits staged in the Exhibition Halls at Fortnightly Shows, and awards made by the Council are based largely on the Committees' recommendations.

In connexion with the submission of new plants to the Committees for certificate or for selection for trial, each plant must be entered with the Secretary of the appropriate Committee, who will say where the plant should be placed. Forms for this purpose may be obtained from the Society's Office before the Committee Meetings, or from the Secretaries of the Committees on the mornings of the Committee Meetings. All plants submitted to the Committees should be named as a means of future identification. If the exhibitor believes that the plant has a name, although it is unknown to him, the words "Name unknown" should be written on the entry form in the place provided for the name, and the Committee will then endeavour to identify the plant. If the plant is of garden origin, it should be named by its owner or raiser before it is submitted to the Committee. The names must conform to the Rules of Nomenclature adopted at the Ninth International Horticultural Congress held in London in 1930 (see p. 39). No award will be made to anything without a name. If the naming is in doubt, the award may be made subject to the verification of the name, and if the proposed name does not conform to the Rules of Nomenclature, any award made will be subject to the alteration of the name. Exhibitors are particularly requested to supply the information required by the entry form, and also any additional particulars which they may think interesting for publication. They will also greatly facilitate the work of the Committees by sending specimens of well-known varieties for comparison.

In considering a new plant it is laid down—(a) that no recommendation for a First Class Certificate or an Award of Merit shall be made to the Council unless at least six members vote for it ; (b) that no recommendation for an Award shall be made unless the number of votes cast in favour of it is at least double the number recorded against it ; and (c) that while the merits of an exhibit shown by a member of the Committee, or in which any member of the Committee is professionally interested, are under discussion, the member concerned must withdraw and not take part in the voting.

Specimens of plants that have received Awards or which have been selected for trial will be placed on the New-Plant Stand in the Hall. Exhibitors entering new plants before the Committees must understand before doing so that if the variety is selected for trial, they tacitly agree to send the number of plants or seeds of it required for trial the following year, and that if any Award is made, they give their consent to the object being painted or photographed for the Society.

THE NAMING OF PLANTS.

NAMES are given to plants so that when they are spoken or written about there may be no confusion as to the particular plant referred to. Every plant must therefore bear one name only, which must be universally accepted.

At the International Horticultural Conferences of London in 1930 and Paris in 1932, the nomenclature of garden plants was fully discussed and general agreement was reached on most matters that relate to the naming of garden plants.

The principles governing the naming of plants by botanists were accepted as the basis for the naming of plants of garden origin, these principles being :

1. A plant can bear but one valid name.
2. The valid name is the earliest which conforms to the accepted Rules of Nomenclature.

Names of species and botanical varieties are framed according to the Rules of Botanical Nomenclature agreed at the Botanical Congress of Vienna in 1905 and revised at the Congresses of Brussels in 1910 and Cambridge in 1930.

Briefly the botanical name of a species consists of two words of Latin form. The first is that of the genus to which the plant belongs, written with an initial capital letter ; the second, the earliest specific name given by Linnæus in 1753 or by botanists subsequently, so long as it conforms with the rules, written usually with a small initial letter (e.g. *Berberis aggregata*). A capital initial letter is, however, given where specific names are derived from names of persons (but not places) (e.g. *Berberis Wilsonae*, *Campanula Allionii*) or are those of old genera (e.g. *Crataegus Oxyacantha*, *Ranunculus Flammula*). The Paris Conference recommends that for horticultural purposes all specific names should be written with a small initial letter.* The gender of the specific name is the same as that of the genus (e.g. *Ranunculus parnassifolius*, *Primula japonica*, *Arum maculatum*, but most trees are regarded as feminine, so *Quercus sessiliflora* and *Fagus sylvatica* are correct).

For a full discussion of these botanical names the " Rules " should be consulted.

In order to obtain uniformity in the use of generic names, a list of the genera which are sometimes divided by botanists has been drawn up and recommendations are made as to the name to be retained in horticulture. These names are chosen in conformity with the Rules and apply only where differences of treatment are given by botanists.

Names of botanical varieties follow the name of the species to which they belong. Thus, e.g., the botanical varieties of *Narcissus triandrus* would be *Narcissus triandrus* var. *albus*, *N. triandrus* var. *calathinus*, *N. triandrus* var. *concolor*, and so on. These varietal names follow the same rules as specific names.

Names of species and botanical varieties are thus fully provided for.

Plants raised in gardens as seedlings or sports of these species or as hybrids between species often have to be named by non-botanical people, and the following rules, agreed to at the International Horticultural Conferences of London and Paris, are for their guidance. They are based on the principles and rules which have been briefly outlined.

- (a) The name of a horticultural variety should be placed after that of the species to which it belongs, and its status should, or may, be indicated by the contraction " var. " Examples are given below.
- (b) The varietal name should be of Latin form only when it expresses some character of the plant, e.g. *nanus*, *fastigiatus*, *albus*, or its place of origin, e.g. *hewensis*.

The use of Latin proper names for horticultural varieties is not permissible, e.g. *Iris pallida Smithii* would be an inadmissible name for a garden variety.

- (c) The name will thus usually be a " fancy " name, beginning with a capital letter, e.g. *Galega officinalis* var. ' George Hartland,' not *Galega officinalis* var. *Hartlandii*; *Dianthus deltoides* var. ' Brilliant,' not *Dianthus deltoides* var. *brilliantissimus*; *Pea* ' Masterpiece.'
- (d) Varietal names must not be translated when transferred from other languages, but must be preserved in the language in which they were originally described. Where desirable a translation may be placed in brackets after the varietal name.

* This recommendation follows the practice of zoologists in naming animals. For the present the Society thinks it better to follow the recommendation in the " Rules of Botanical Nomenclature " in its own publications.

(e) As far as possible names of horticultural varieties should consist of a single word ; the employment of not more than three words is permitted as a maximum.

(1) A varietal name in use for one variety of a kind of plant should not be used again for another variety of that kind, even though it may be attached to a different species.

That is, the use of the name *Narcissus Pseudonarcissus* 'Victoria,' should preclude the use of 'Victoria' as a varietal name for any other species of *Narcissus*, such as *Narcissus poeticus* 'Victoria.' Similarly there should be but one *Iris* 'Bridesmaid,' one Plum 'Superb' and so on.

(2) Varietal names likely to be confused with one another should be avoided. For instance, the use of the name 'Alexander' should preclude the use of 'Alexandra,' 'Alexandria,' and 'Alexandrina' as varietal names for the same kind of plant.

(3) Where personal names are used to designate varieties, the prefixes "Mr.," "Mrs.," "Miss," and their equivalents should be avoided.

(4) Excessively long words and words difficult to pronounce should be avoided in coining varietal names.

(5) The articles "a" and "the" and their equivalents should be avoided in all languages when they do not form an integral part of the substantive, e.g. 'Colonel,' not 'The Colonel'; 'Giant,' not 'The Giant'; 'Bride,' not 'The Bride.'

(6) Existing names in common use should not be altered to conform to these rules, but attention should be paid to them in all new names proposed.

(f) The names of horticultural hybrids are formed in the same way as those of horticultural varieties (see paras. a-e).

[Hybrids are indicated by the multiplication sign \times placed before the name of the hybrid.]

(g) The "genus" of bigeneric hybrids (i.e. hybrids between species of two different genera) is designated by a formula showing the parent genera in alphabetical order, and where necessary by a name compounded of the names of both genera, e.g. *Laeliocattleya*, *Urceocharis*, *Chionoscilla*.

(h) The "genus" of multigeneric hybrids (i.e. hybrids between species of three or more genera) is also designated by a formula and/or a conventional name, preferably that of a distinguished person to which is added the termination "ara," e.g. *Potinara*, *Vuyestekeara*. The names of trigeneric hybrids already in use, e.g. *Brassolaeliocattleya*, should be retained. All hybrids in which the same genera are combined receive the same generic name, no matter how they were combined, e.g. the same generic name would apply to all combinations of the genera *Brassavola*, *Cattleya*, *Epidendrum* and *Laelia*.

(i) All plants raised by crossing the same two species of plants receive the same specific name, variations between the seedlings being indicated where necessary by varietal names framed as already described. In practice in cross-bred plants, the specific name is frequently omitted, e.g. *Iris* 'Ambassadeur.'

(k) In order to be valid, a name must be published.

(l) The publication of a name of a horticultural variety or hybrid is effected by a recognizable description, with or without a figure, in any language written in Roman characters.

(m) The description must appear in a recognized horticultural or botanical periodical, or in a monograph or other scientific publication, or in a dated horticultural catalogue.

(n) The mention of a variety without description in a catalogue, or in the report of an exhibition, is not valid publication, even if a figure is given. It is desirable that descriptions of new varieties in horticultural catalogues should also be published in periodical horticultural papers.

SCIENTIFIC COMMITTEE FOR 1935.

The Scientific Committee reports upon diseases, pests, newly imported plants, first hybrids between species, curious plants, inventions and such other objects of horticultural interest and value as may be brought before it by Fellows and by other Committees of the Society, deals with the determination of doubtful plants and their correct nomenclature, and considers proposals and makes recommendations for Botanical Certificates and Certificates of Appreciation. Fellows are therefore strongly urged to send specimens, with explanatory notes, of any new plants, of attacks of insects or fungi, or of other similar troubles on which they would like to obtain the opinion of the Committee. As full reports as possible will be published in the Society's JOURNAL and forwarded to the senders. All communications should be addressed to "The Secretary of the Scientific Committee, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1," and must reach the Society's offices not later than 2 P.M. on the day of the Meeting.

In considering the recommendation of the Botanical Certificate, regard is paid to (a) the special botanical interest of the plant exhibited; and (b) the desirability of encouraging the introduction and exhibition of novelties, even though they may not be of immediate commercial value, nor of a specially decorative character. Peculiarity of morphological or anatomical construction, physiological endowments, or adaptation to varying conditions; novelty, whether of introduction or of cultural origin; geographical distribution; potential value for garden or economic uses are all matters to be taken into account.

CHAIRMAN.

BOWLES, E. A., M.A., F.R.E.S., V.M.H., Myddelton House, Waltham Cross.

VICE-CHAIRMEN.

COTTON, A. D., O.B.E., F.L.S., The Herbarium, Royal Botanic Gardens, Kew.
 RENDLE, A. B., M.A., D.Sc., F.R.S., F.L.S., V.M.H., Talland, The Mount, Fetcham Park, Leatherhead, Surrey.

CHITTENDEN, F. J., F.L.S., V.M.H., R.H.S. Offices. (*Secretary*.)

ARKWRIGHT, Sir JOHN S., J.P., D.L., Kinsham Court, Presteign, Radnorshire.
 ARMSTRONG, Prof. H. E., LL.D., F.R.S., 55 Granville Park, Lewisham, S.E. 13.
 BAKER, E. G., 3 Cumberland Road, Kew, Surrey.
 BAKER, F. J., A.R.C.S., Fisherswood, Sharnal Street, Hoo, Rochester, Kent.
 BAKER, W. G., The Botanic Garden, Oxford.
 BALFOUR, F. R. S., M.A., D.L., J.P., V.M.H., 13 Collingham Gardens, S.W. 5.
 BARKER, Prof. B. T. P., M.A., University of Bristol Research Station, Long Ashton, Bristol.
 BESANT, J. W., Botanic Gardens, Glasnevin, Dublin, N.W. 3.
 BEWLEY, W. F., D.Sc., Experimental and Research Station, Cheshunt, Herts.
 BLACKMAN, Prof. V. H., M.A., Sc.D., F.R.S., Imperial College of Science, S.W. 7.
 BLAIR, K. G., Sc.D., F.R.E.S., British Museum (Natural History), Cromwell Road, S.W. 7.
 CRANE, M. B., A.L.S., John Innes Horticultural Institution, Merton Road, Merton Park, S.W. 19.
 FARMER, Sir JOHN B., LL.D., D.Sc., F.R.S., V.M.H., St. Leonards, Weston Rd., Bath.
 FRASER, JOHN, F.L.S., V.M.H., 355 Sandycroft Road, Kew, Surrey.
 GROVE, A., F.L.S., V.M.H., 2 Albion Street, W. 2.
 HALES, W., A.L.S., V.M.H., Chelsea Physic Garden, S.W. 3.
 HALL, Sir DANIEL, K.C.B., LL.D., Sc.D., F.R.S., John Innes Horticultural Institution, Merton, S.W. 19.
 HANBURY, F. J., F.L.S., F.R.E.S., V.M.H., Brockhurst, East Grinstead, Sussex.
 HILL, Sir ARTHUR W., K.C.M.G., M.A., Sc.D., F.R.S., F.L.S., V.M.H., Royal Botanic Gardens, Kew, Surrey.
 HOOPER, Cecil H., F.L.S., F.S.I., Oxenturn, Wye, Kent.
 HOSKING, A., Crossriggs, Poltimore Road, Guildford, Surrey.
 HURST, C. C., Sc.D., Ph.D., F.L.S., D.L., J.P., 50 Knighton Drive, Leicester.†

- JACKSON, A. BRUCE, A.L.S., 3 The Avenue, Kew Gardens, Surrey.
 KEEBLE, Sir FREDERICK, C.B.E., M.A., Sc.D., F.R.S., F.L.S., Hamels, Boar's Hill, Oxford.
 MARSDEN-JONES, E. M., F.L.S., The Potterne Biological Station, Devizes, Wilts.
 ODELL, J. W., 116 Welldon Crescent, Harrow, Middlesex.
 PERCIVAL, Prof. J., M.A., Sc.D., F.L.S., Leighton, Shinfield, Reading, Berks.
 PRAIN, Lieut.-Col. Sir DAVID, C.M.G., C.I.E., LL.D., F.R.S., F.L.S., V.M.H., The Well Farm, Warlingham, Surrey.
 PRESTON, F. G., The Botanic Garden, Cambridge.
 RAMSBOTTOM, J., O.B.E., M.A., F.L.S., British Museum (Natural History), Cromwell Road, S.W. 7.
 RUSSELL, Sir E. JOHN, D.Sc., F.R.S., Rothamsted Experimental Station, Harpenden, Herts.
 SALMON, Prof. E. S., F.L.S., South-Eastern Agricultural College, Wye, Ashford, Kent.
 SMITH, Sir WILLIAM WRIGHT, M.A., F.L.S., V.M.H., Royal Botanic Garden, Edinburgh, 4.
 VOELCKER, J. A., C.I.E., Ph.D., M.A., F.I.C., F.L.S., 1 Tudor Street, E.C. 4.
 WAKEHURST, Lord, Wakehurst Place, Ardingly, Sussex.
 WEISS, Prof. F. E., D.Sc., LL.D., F.R.S., F.L.S., Easedale, Woodway, Mellow, near Guildford, Surrey.
 WILSON, GURNEY, F.L.S., 53 Hove Park Villas, Hove, Sussex.
 WORSDELL, W. C., 57 Cresswell Road, East Twickenham, Middlesex.
 WORSLEY, A., J. P., Mandeville House, Isleworth, Middlesex.

NOTE.—Members of the Council are Members of this Committee, and Chairmen of Standing and Joint Committees are *ex-officio* members.

The Committee will meet at 4 P.M. on the first day of all Fortnightly Meetings.

* * *

FRUIT AND VEGETABLE COMMITTEE FOR 1935.

CHAIRMAN.

BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.

VICE-CHAIRMEN.

CHEAL, JOSEPH, V.M.H., Lowfield, Crawley, Sussex.
 NIX, C. G. A., V.M.H., Tilgate, Crawley, Sussex.
 POUPART, W., V.M.H., Ferndale, Rydens Road, Walton-on-Thames, Surrey.
 RAWES, A. N., R.H.S. Gardens, Wisley. (*Secretary.*)

BARNETT, H. T., Westwood House, Tilehurst, Berks.
 BASHAM, JOSEPH, Fair Oak Nurseries, Bassaleg, near Newport, Mon.
 BECKETT, E., V.M.H., Grove House, Park Road, Radlett, Herts.
 BOSTOCK, F., Pitsford House, Northampton.
 BULLOCK, A., Copped Hall Gardens, Epping, Essex.
 DIVERS, W. H., V.M.H., Westdean, Hook, near Surbiton, Surrey.
 EARL, W. J., Knowsley Gardens, Prescott, Lancs.
 GILES, W. F., Furzebank, 38 Redlands Road, Reading, Berks.
 GOODE, F., Brocket Hall Gardens, Welwyn, Herts.
 HALL, H. J., The Gardens, Harewood, near Leeds.
 HALL, R. H., The Gardens, Hatfield House, Hatfield, Herts.
 HOLLOWAY, W. H., The Gardens, Tewin Water, Welwyn, Herts.
 JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.
 KELF, GEO., 140 Ivy Road, Cricklewood, N.W. 2.
 LAXTON, E. A. L., V.M.H., 63 High Street, Bedford.
 LOBJOIT, Sir WILLIAM G., O.B.E., J.P., V.M.H., Oakdene, Wooburn, High Wycombe, Bucks.
 MARKHAM, H., Wrotham Park Gardens, Barnet, Herts.
 METCALFE, A. W., Luton Hoo Gardens, Luton, Beds.
 NEAL, E., The Gardens, Tilgate, Crawley, Sussex.
 POUPART, A., Dovers, Rainham, Essex.
 PRINCE, H., 119 St. Peter's Road, Earley, Reading, Berks.
 RICHARDS, J. M., The Gardens, Gatton Park, Reigate, Surrey.

RIVERS, H. SOMERS, Sawbridgeworth, Herts.
 SECRET, F. A., F.L.S., Holly Lodge Farm, Rydens Road, Walton-on-Thames.
 SMITH, A. C., Estate Office, Hexton Manor, Hitchin, Herts.
 STREETER, F., Petworth Park Gardens, Petworth, Sussex.
 TAYLOR, H. V., O.B.E., B.Sc., Ministry of Agriculture and Fisheries, S.W. 1.
 TOMALIN, T. E., Stansted Park Gardens, Rowland's Castle, Hants.
 TUCKETT, P. DEBELL, 17 Durham Villas, Kensington, W. 8.
 WESTON, J. G., The Gardens, Chatsworth, Bakewell, Derbyshire.
 WILSON, JAMES, The Gardens, Trent Park, New Barnet, Herts.
 WOODWARD, J. G., Barham Court Gardens, Teston, Maidstone, Kent.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 12 NOON on the first day of all Fortnightly Meetings ; at the Daffodil Show, April 16 ; at the Autumn Show, National Hall, Olympia, on Wednesday, September 25 ; at the Fruit and Vegetable Show on Tuesday, October 8 ; and at 4 P.M. on Tuesday, May 21, at Chelsea.

Entries for the Chelsea Show must be handed in by 11.45 A.M. on Tuesday, May 21 ; at other meetings by 11.30 A.M.

All fruits for certificates must be ripe or in such a condition that their quality may be estimated. To permit a correct description being drawn up, a sufficient sample must be sent for tasting, together with leaves (if available), and a small branch to show the growth. Of apples, pears, peaches, nectarines, apricots, and plums—not fewer than nine must be sent ; of damsons and bullaces—thirty fruits ; of cherries and raspberries—fifty fruits ; of strawberries—twenty fruits ; of gooseberries—thirty fruits ; of red and white currants—thirty bunches ; of black currants—one pound ; of nuts—one pound ; of tomatoes—two plants in fruit. Details of the origin and chief characteristics of the variety, together with the age of the tree, must be given on the entry form. In the case of peaches and nectarines, the size of the flowers must be stated.

A First Class Certificate can only be awarded to a variety which has received an Award of Merit, and when its growth and cropping habits are known to several Members of the Committee. If necessary the Chairman will appoint a Committee of three to inspect and report upon the growing tree. Promising varieties of hardy fruits are recommended for the trials for commercial purposes at Wisley.

Awards are not made to the following plants until their cropping qualities and distinctive merits have been ascertained by trial at Wisley :—Beans, Brassicas, Cucumbers, Melons, Peas, Potatos, Tomatos, and similar fruits and vegetables. Awards are not recommended in London to plants which can be, and usually are, raised each year from seed and brought to maturity within a year from the sowing of the seed. Nor are awards recommended independently in London to plants which are usually perpetuated by seed if the class to which they belong is under trial at Wisley, has been tried in the previous year, or is on the Trials Calendar for the ensuing year. Awards to plants commonly grown from seed each year are given to the strain and not to the individual plants.

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FLORAL COMMITTEE A FOR 1935.

Floral Committee A deals with Florists' Flowers and Plants, except Orchids, Narcissi and Tulips, Dahlias, Delphiniums, Irises, Perpetual Flowering and Border Carnations and Picotees. For these see the Special or Joint Committees.

CHAIRMAN.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.

VICE-CHAIRMEN.

BRIDGEFORD, J. M., 27 Drury Lane, Covent Garden, W.C. 2.

INGAMELLS, D., 27 Catherine Street, Covent Garden Market, W.C. 2.

CARTWRIGHT, W. D., R.H.S. Gardens, Wisley. (*Secretary.*)

ALLAN, D., c/o Dobbie's Seed Farms, Marks Tey, Essex.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.

CAMPBELL, D., Park Superintendent's Office, Inner Circle, Regent's Park, N.W.

CHURCHER, Major GEO., Beckworth, Lindfield, Sussex.
 CRANE, D. B., 50 Cholmeley Crescent, Cholmeley Park, Highgate, N. 6.
 DARLINGTON, H. R., M.A., F.L.S., Park House, Potters Bar, Middlesex.
 DAWKINS, A., 408 King's Road, Chelsea, S.W. 10.
 DICKSON, HUGH, c/o T. Cullen & Sons, Witham, Essex.
 ENGELMANN, C., Saffron Walden, Essex.
 GINGELL, W. B., 26 Minard Road, Catford, S.E. 6.
 JAMES, E. R., Iwerne, London Road, Reading, Berks.
 LANGDON, C. F., Twerton Hill Nursery, Bath, Somerset.
 PAGE, COURTNEY, 117 Victoria Street, S.W. 1.
 RIDING, JAS. B., The Nurseries, Chingford, E. 4.
 ROSCOE, V. L., c/o Hurst & Son, 152 Houndsditch, E.C. 3.
 SIMMONS, D. W., 11 Harlesden Road, St. Albans, Herts.
 SMITH, Mrs. LINDSAY, Postford House, Chilworth, Surrey.
 STEVENSON, T., Colham Green Nurseries, Hillingdon, Middlesex.
 TRACEY, Mrs. I. A., High Hall, Wimborne, Dorset.
 TRESADER, F. G., The Nurseries, Cardiff.
 WELLS, BEN., Hardy Plant Nurseries, Merstham, Surrey.
 WEST, J. T., Tower Hill, Brentwood, Essex.
 WIGHTMAN, Mrs., Bengoe, Hertford, Herts.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 12.15 P.M. on the first day of all Fortnightly Meetings ; at the Daffodil Show, April 16 ; at the Amateurs' Flower Show on Tuesday, June 25 ; at the Autumn Show, National Hall, Olympia, on Wednesday, September 25 ; at the Fruit and Vegetable Show on Tuesday, October 8 ; and at 4 P.M. at Chelsea on Tuesday, May 21.

Entries must be handed in to the Secretary of the Committee before 11.45 A.M. on all occasions when the Committee meets.

The number of specimens required varies according to the heading under which an award is sought ; for an award as a show flower, at least three open blooms, either cut or on a plant or plants, must be shown ; for an award as a variety for cutting or for market, at least sufficient cut flowers to fill a vase, and in the case of a rose, a plant in bloom ; for an award as an ornamental pot-plant, at least three plants in pots, one of which, in the case of a chrysanthemum, must be shown without any disbudding while the other two should be somewhat disbudded ; for an award as a bedding plant, one plant will usually be sufficient ; and for an award as a variety for the herbaceous border in all practicable cases at least one growing plant will be required, but cut specimens, if sufficient, will be admissible when the habit of the plant is well known.

The following florists' flowers and plants are given awards only after trial at Wisley :—Anemone (Japanese), Aster (Michaelmas Daisy), Aubrietia, Auricula, Chrysanthemum (early flowering), Cistus, Dianthus (Pinks), Fuchsia, Gladiolus, Helianthemum, Hemerocallis, Kniphofia, Lachenalia, Lupinus (perennial), Nerine, Pæony, Phlox (herbaceous and alpine), Primrose, Pyrethrum, Veronica (herbaceous), Viola. When any of these plants is submitted to the Committee in London, and considered worthy, it is selected for trial at Wisley.

No award, except Preliminary Commendation, is recommended in London to plants which can be, and usually are, raised each year from seed and flowered within a year from the sowing of the seed ; and no award, except Preliminary Commendation, is recommended independently in London to plants which are usually perpetuated by seed if the class to which they belong is under trial at Wisley, has been tried in the previous year, or is on the Trials Calendar for the ensuing year. All plants which receive Preliminary Commendations under this regulation are selected for trial at Wisley. Awards to plants commonly grown from seed each year are given to the strain and not to individual plants.

FLORAL COMMITTEE B FOR 1935.

Floral Committee B deals with Plants other than Florists' Flowers and Plants, except Orchids other than hardy terrestrial kinds, Narcissi and Tulips, Dahlias and Delphiniums, Irises and Rhododendrons. For these see Special or Joint Committees.

CHAIRMAN.

MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.

VICE-CHAIRMEN.

ABERCONWAY, Lord, C.B.E., V.M.H., 38 South Street, Mayfair, W. 1.

BEAN, W. J., I.S.O., V.M.H., 2 Mortlake Road, Kew, Surrey.

BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Waltham Cross, Herts.

WAKEHURST, Lord, Wakehurst Place, Ardingly, Sussex.

GOULD, N. K., R.H.S. Gardens, Wisley. (*Secretary.*)

BAKER, G. P., V.M.H., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.

BAKER, W. G., The Botanic Garden, Oxford.

BALFOUR, A. P., c/o Sutton & Sons, Ltd., Seed Trial Grounds, Slough, Bucks.

BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.

BYNG OF VIMY, The Viscountess, Thorpe Hall, Thorpe-le-Soken, Essex.

CLARKE, Lt.-Col. STEPHENSON R., C.B., J.P., Borde Hill, Haywards Heath, Sussex.

COUTTS, J., V.M.H., Royal Botanic Gardens, Kew, Surrey.

CRANFIELD, W. B., F.L.S., East Lodge, Enfield Chase, Middlesex.

ELLIOTT, CLARENCE, Six Hills Nursery, Stevenage, Herts.

FARDEN, R. S., Ridgehurst, Ridgeway, Sutton, Surrey.

FENWICK, MARK, J.P., Abbotswood, Stow-on-the-Wold, Glos.

HALES, WM., A.L.S., V.M.H., Chelsea Physic Garden, S.W. 3.

HARTINGTON, The Marquess of, M.P., Churchdale Hall, near Bakewell, Derbyshire.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

INGWERSEN, W. E. Th., Birch Farm Hardy Plant Nursery, Gravetye, East Grinstead, Sussex.

JENKINSON, Capt. R. C. H., Knap Hill Manor, near Woking, Surrey.

MARSDEN-JONES, E. M., F.L.S., The Potterne Biological Station, Devizes, Wilts.

NOTCUTT, R. C., Woodbridge, Suffolk.

OLDHAM, W. R., J.P., Sherwood, Windlesham, Surrey.

PERRY, AMOS, Hardy Plant Farm, Enfield, Middlesex.

PRESTON, F. G., The Botanic Garden, Cambridge.

REUTHE, G., Sunnycroft, 109 Crown Lane, Bromley, Kent.

RUSSELL, L. R., V.M.H., Richmond Nurseries, Richmond, Surrey.

STANLEY, Lady BEATRIX, 8 Little College Street, S.W. 7.

STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.

STOKER, Dr. FRED, F.L.S., The Summit, Golding's Hill, Loughton, Essex.

WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

WILDING, E. H., Wexham Place, Stoke Poges, Bucks.

WILLIAMS, C., M.P., 59 Tufton Street, Westminster, S.W. 1.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 12.15 P.M. on the first day of all Fortnightly Meetings; at the Daffodil Show, April 16; at the Amateurs' Flower Show on Tuesday, June 25; at the Autumn Show, National Hall, Olympia, on Wednesday, September 25; at the Fruit and Vegetable Show on Tuesday, October 8; and at 4 P.M. on Tuesday, May 21, at Chelsea.

Entries must be handed in to the Secretary of the Committee before 11.45 A.M. on all occasions when the Committee meets.

The number of specimens required varies according to the heading under which an award is sought: for an award as a plant for the rock garden, for an alpine house, or for bedding, at least one plant must be shown and an alpine house plant must be shown growing in a pot or pan; for an award as a plant for the herbaceous border or as a plant for the water garden, a growing plant is required wherever practicable, but cut specimens, if sufficient, are admissible when the habit of the plant is well known; for an award as a plant for cutting, at least sufficient cut material to fill a vase must be shown.

No award, except Preliminary Commendation, is recommended in London to plants which can be, and usually are, raised each year from seed and flowered within a year from the sowing of the seed; and no award, except Preliminary Commendation, is recommended independently in London to plants which are usually perpetuated by seed if the class to which they belong is under trial at Wisley, has been tried in the previous year, or is on the Trials Calendar for the ensuing year. All plants which receive Preliminary Commendations under this regulation will be selected for trial at Wisley. Awards to plants commonly grown from seed each year are given to the strain and not to individual plants.

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ORCHID COMMITTEE FOR 1935.

The Orchid Committee deals with all Orchids, except hardy terrestrial species, for which see Floral Committee B.

CHAIRMAN.

COLMAN, Sir JEREMIAH, Bt., M.A., D.L., J.P., V.M.H., Gatton Park, Reigate, Surrey.

VICE-CHAIRMEN.

CLARKE, Lt.-Col. STEPHENSON R., C.B., J.P., Borde Hill, Haywards Heath, Sussex.

HANBURY, F. J., F.L.S., F.R.E.S., V.M.H., Brockhurst, East Grinstead, Sussex.

ROTHSCHILD, LIONEL DE, O.B.E., V.M.H., 18 Kensington Palace Gardens, W. 8.

WILSON, GURNEY, F.L.S., 53 Hove Park Villas, Hove, Sussex. (*Secretary.*)

ALEXANDER, H. G., V.M.H., Woodlands, Westonbirt, Tetbury, Glos.

ARMSTRONG, T., Orchidhurst, Sandhurst Park, Tunbridge Wells, Kent.

ASHTON, E. R., Broadlands, Camden Park, Tunbridge Wells, Kent.

COOKSON, CLIVE, Crescent House, Newcastle-upon-Tyne, 1.

CURTIS, C. H., F.L.S., V.M.H., 24 Boston Road, Brentford, Middlesex.

DYE, A., Tring Park Gardens, Tring, Herts.

FLORY, SYDNEY W., Orchid Nursery, Slough, Bucks.

HATCHER, W. H., Cragg Wood Nurseries, Rawdon, Leeds, Yorks.

HOLMES, Mrs. MARGOT A., 56 Avenue Road, Regent's Park, N W. 8.

HURST, C. C., Sc D., Ph D., F.L.S., D.L., J.P., 50 Knighton Drive, Leicester.

JAMES, The Hon. ROBERT, St. Nicholas, Richmond, Yorks.

LAWSON, HENRY P., Lynbrook, Knaphill, Woking, Surrey.

LOW, STUART H., Bush Hill Park, Enfield, Middlesex.

MCBEAN, A. A., Cooksbridge, Sussex.

MERRY, A., Orchid Department, The Boxes, Pevensey Bay, Pevensey, Sussex.

MOORE, Dr. F CRAVEN, Duckyls, near East Grinstead, Sussex.

MOORE, Sir FREDERICK W., M.A., F.L.S., V.M.H., Willbrook House, Rathfarnham, co Dublin.

SANDER, FREDERICK K., The Camp, St. Albans, Herts.

SHILL, J. E., Orchid Department, Dell Park, Englefield Green, Surrey.

SMITH, H. H., F.L.S., c/o Charlesworth & Co., Ltd., Haywards Heath, Sussex.

WILSON, E. K., Cannizaro, Wimbledon, S.W. 19.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 11.45 A.M. on the first day of all Fortnightly Meetings; at the Daffodil Show, April 16; at the Amateurs' Flower Show on Tuesday, June 25; at the Autumn Show, National Hall, Olympia, on Wednesday, September 25; at the Fruit and Vegetable Show on Tuesday, October 8; and at 2.30 P.M. on Tuesday, May 21, at Chelsea.

Entries at the Chelsea Show must be handed to the Secretary of the Committee before 11.45 A.M. and on all other days when the Committee meets before 10.30 A.M.

Usually a growing plant is required, but when the plant would have to be sent from abroad, or from such a great distance that its transport would be an unreasonable burden for the exhibitor, the Committee may regard a cut spike as sufficient.

NARCISSUS AND TULIP COMMITTEE FOR 1935.**CHAIRMAN.**

BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Waltham Cross, Herts.

VICE-CHAIRMEN.

ENGLEHEART, Rev. G. H., M.A., V.M.H., Little Clarendon, Dinton, Salisbury, Wilts.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.

MONRO, GEORGE, C.B.E., V.M.H., 4 Tavistock Street, Covent Garden, W.C. 2.

WILLIAMS, P. D., V.M.H., Lanarth, St. Keverne, R.S.O., Cornwall.

SIMMONDS, A., N.D.H., R.H.S. Offices. (Secretary.)

ARKWRIGHT, Sir JOHN S., D.L., J.P., Kinsham Court, Presteign, Radnorshire.

BARR, P. R., V.M.H., 36 Belsize Park, N.W. 3.

BERKELEY, R. G., Spetchley Park, Worcester.

BRODIE of BRODIE, Mrs., O.B.E., Brodie Castle, Forbes, N.B.

CHURCHER, Major GEO., Beckworth, Lindfield, Sussex.

COPELAND, W. F. M., West View, 156 St. James Road, Southampton.

COWEN, A., c/o J. R. Pearson & Son, Ltd., Lowdham, Notts.

CRANFIELD, W. B., F.L.S., East Lodge, Enfield Chase, Middlesex.

CURTIS, C. H., F.L.S., V.M.H., 24 Boston Road, Brentford, Middlesex.

DARNLEY, The Earl of, Cobham Hall, Cobham, Kent.

FAVELL, Dr R. V., Penberth, St. Buryan, S.O., Cornwall.

HALL, Sir DANIEL, K.C.B., LL.D., Sc.D., F.R.S., John Innes Horticultural Institution, Merton, S.W. 19.

HAWKER, Capt. H. G., Strode, Ermington, S. Devon.

JONES, A. J., c/o Carters' Tested Seeds, Ltd., Raynes Park, S.W. 20.

MEYER, Rev. Canon ROLLO, Watton-at-Stone Rectory, Hertford.

NEEDHAM, C. W., Kelmscott, Hale, Cheshire.

POUPART, W., V.M.H., Ferndale, Rydens Road, Walton-on-Thames, Surrey.

RICHARDSON, J. LIONEL, Prospect House, Waterford, Ireland.

SECRET, F. A., F.L.S., Holly Lodge Farm, Rydens Road, Walton-on-Thames, Surrey.

SLINGER, W., c/o Donard Nursery Co., Newcastle, co. Down, Ireland.

SMITH, H., Marken Swanshurst Lane, Moseley, Birmingham.

STANLEY, Lady BEATRIX, 8 Little College Street, S.W. 1.

STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.

TITCHMARSH, C. C., N.D.H., Barrow, Englishcombe, Bath, Somerset.

WHITE, A. W., c/o J. T. White & Sons, Ltd., Daffodil Nurseries, Spalding, Lincs.

WILLIAMS, A. M., Werrington Park, Launceston, Cornwall.

WILSON, GUY L., The Knockan, Broughshane, co. Antrim, Ireland.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 11 A.M. on the first day of all Fortnightly Meetings during February, March, April, and May ; at 12 NOON at the Daffodil Show, on Tuesday, April 16 ; and at 3 P.M. on Tuesday, May 21, at Chelsea.

Entries must be handed in to the Secretary of the Narcissus and Tulip Committee before 11 A.M. at the Daffodil Show ; before 11.45 A.M. at the Chelsea Show ; and before 10.30 A.M. on other occasions when the Committee meets.

The number of specimens required varies according to the award sought. For a Preliminary Commendation as a show daffodil, one stem is sufficient, but for an Award of Merit nine stems are required, and for a First Class Certificate eighteen. To obtain any award as a variety for cutting, twenty-four stems must be shown and the same number is required in order that a daffodil may be selected for trial at Kirton as a market variety for cutting from the open. In order to be selected for trial at Kirton as a daffodil for garden decoration twelve stems are sufficient. For an Award of Merit as a daffodil for cultivation in pots, pans, or bowls, two pots, pans or bowls, each with not fewer than three bulbs,

must be shown, and four pots, pans or bowls are required for a First-Class Certificate. Not fewer than twelve bulbs, growing in pots, bowls or boxes, must be shown in order that a daffodil may obtain any award as a variety for forcing for market. Directions regarding the vases to be used for daffodils are given on the entry forms. Of a tulip shown as a variety for garden decoration, six stems are sufficient to obtain a Preliminary Commendation, but not fewer than twelve must be shown for an Award of Merit or a First Class Certificate. When staged as a tulip for forcing at least twelve plants must be exhibited as grown in no fewer than two pots, pans, bowls or boxes. A species or variety of a species of tulip may receive a Preliminary Commendation when only one stem is shown, but at least three stems are required for an Award of Merit or a First Class Certificate.

Trials of daffodils are carried out by the Holland County Council in co-operation with the Society at the Agricultural Institute and Experimental Station, Kirton, near Boston, Lincs. These trials are for varieties considered suitable for cutting from the open for market or for garden decoration. Only varieties selected by the Narcissus and Tulip Committee at its meetings in London are grown in the trials at Kirton. Trials of very early varieties considered suitable for cutting from the open for market are carried out by the Cornwall County Council in co-operation with the Society at the Experimental Station, Gulval, Penzance. Only very early varieties can be accepted for these trials, and the Education Committee of the Cornwall County Council reserves the right to refuse any entry. Those who wish to send varieties for trial at Gulval should apply for entry forms to the County Horticultural Superintendent, County Hall, Truro. An award as a variety for cutting from the open for market is usually given only after trial at Kirton or Gulval, but an award may be given to a variety which has been shown in London and favourably reported upon by an *ad hoc* Sub-Committee after examination of the variety whilst in bloom on the premises of the owner. An award as a variety for garden decoration is usually given to a daffodil only after trial at Kirton, but it may be given to a tulip after examination of specimens exhibited in London.

In the interests of all concerned, it is very desirable that only registered names should be used for daffodils, and the Council appeals to all raisers, and to all who purchase stocks of new varieties, to co-operate with the Society in its efforts to prevent the confusion which must inevitably arise if names are given without regard to those already in use. As soon as it is decided that a seedling is worth naming, and while the whole of the stock is in one person's hands, the proposed name should be submitted to the Secretary. Before choosing a name for submission for registration, the latest edition of The Classified List of Daffodil Names should be consulted. A registration fee of 1s. for each name should be sent with the application for registration.

JOINT DAHLIA COMMITTEE FOR 1935.

Deals with all Dahlias.

CHAIRMAN.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

R.H.S. REPRESENTATIVES.

COBB, A. J., The University, Reading, Berks.
CRANE, D. B., 50 Cholmeley Crescent, Cholmeley Park, Highgate, N. 6.
DRAYSON, G. F., 23 Palmerston Road, Buckhurst Hill, Essex.
FIFE, WILLIAM, c/o Dobbie & Co., Ltd., Edinburgh, 7.
RIDING, JAS. B., The Nurseries, Chingford, E. 4.
STEWART, W., Royal Hospital, Chelsea, S.W. 3.

NATIONAL DAHLIA SOCIETY'S REPRESENTATIVES.

ALESWORTH, F. W., 17 Avenue Road, Isleworth, Middlesex. (*Secretary, National Dahlia Society.*)
CAMPBELL, D., Park Superintendent's Office, Inner Circle, Regent's Park, N.W. 1.
CHEAL, J., V.M.H., Lowfield, Crawley, Sussex.

CHURCHER, Major G., Beckworth, Lindfield, Sussex.
 EMBERSON, J., Green Hayes, Lindsey Street, Epping, Essex.
 WEST, J. T., Tower Hill, Brentwood, Essex.

The Committee will meet at the following times :

at 11.15 A.M. at the Fortnightly Meetings on July 16 and 30, August 13 and 27, September 10 and October 15 ; at the Autumn Show, National Hall, Olympia, on Wednesday, September 25 ; at the Fruit and Vegetable Show on Tuesday, October 8 ; and at 12.15 P.M. at the National Dahlia Society's Show on Tuesday, September 3.

Entries must be handed to the Secretary of the Committee before 10.45 A.M.

On any Show-day, when no meeting of the Joint Committee has been arranged, dahlias should be entered with the Secretary of Floral Committee A.

At least three open blooms must be shown. Varieties considered worthy are selected for trial at Wisley and awards are made only after trial.

JOINT DELPHINIUM COMMITTEE FOR 1935.

CHAIRMAN.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.

R.H.S. REPRESENTATIVES.

CAMPBELL, D., Park Superintendent's Office, Inner Circle, Regent's Park, N.W. 1.
 INGAMELLS, D., 27 Catherine Street, Covent Garden Market, W.C. 2.
 JAMES, E. R., Iwerne, London Road, Reading, Berks.
 LANGDON, C. F., Twerton Hill Nursery, Bath, Somerset.
 SMITH, MRS. LINDSAY, Postford House, Chilworth, Surrey.
 STEVENSON, T., Colham Green Nurseries, Hillingdon, Middlesex.
 WELLS, BEN, Hardy Plant Nurseries, Merstham, Surrey.

BRITISH DELPHINIUM SOCIETY'S REPRESENTATIVES.

BONES, T., 46 High Street, Cheshunt, Herts.
 CARLILE, T., Loddon Gardens, Twyford, Berks.
 CHAPLIN, J., c/o Chaplin Bros., Ltd., Royal Nurseries, Waltham Cross, Herts.
 DOCWRA, Mrs. R. E., 31 Upper Brighton Road, Surbiton, Surrey.
 HILL, C. F., Westover, Hartington Road, Hillingdon, Middlesex.
 MACSELF, A. J., Domann, Hamilton Road, Reading, Berks.
 PHILLIPS, G. A., c/o Hewitt & Co., Ltd., The Nurseries, Solihull, Warwickshire.
 ROBERTS, S. HALFORD, 85-86 New Bond Street, W. 1 } *Joint Hon. Secretaries,*
 MOIR, A. J., 3 Warwick Road, Thornton Heath, Surrey } *Delphinium Society.*

The Committee will meet at the following times :

at 11.15 A.M. at the Amateurs' Flower Show on Tuesday, June 25 ; at the Fortnightly Meetings on June 18, July 2 and 16 ; at 12.15 P.M. at the British Delphinium Society's Show on Thursday, June 27 ; at 11.15 A.M. on Tuesday, July 9 ; and at 11.45 A.M. at the British Delphinium Society's Provincial Show at Roundhay Park, Leeds, on Tuesday, July 16.

Entries must be handed to the Secretary of the Committee before 10.45 A.M.

On any Show-day, when no meeting of the Joint Committee has been arranged, Delphiniums should be entered with the Secretary of Floral Committee A.

When exhibited as a variety for show purposes, or as a variety for garden decoration, at least three spikes of flowers, either cut or on a plant or plants, are required, and when staged as a variety for cutting, sufficient cut spikes of flowers to fill a vase must be shown.

An award as a variety for garden decoration is made only after trial at Wisley. Varieties submitted to the Committee at Shows, and considered worthy, are selected for trial.

JOINT IRIS COMMITTEE FOR 1935.

CHAIRMAN.

STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.

VICE-CHAIRMAN.

MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.

R.H.S. REPRESENTATIVES.

BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.

BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Waltham Cross, Herts.

CHRISTIE-MILLER, C. W., Swyncombe House, Henley-on-Thames, Oxon.

COLLET, Lady, St. Clare, Kemsing, Sevenoaks, Kent.

GALSWORTHY, FRANK, Green Lane Farm, Chertsey, Surrey.

JENKINSON, Capt. R. C. H., Knap Hill Manor, near Woking, Surrey.

MEYER, Rev. Canon ROLLO, Watton-at-Stone Rectory, Hertford.

PESEL, Miss L. F., Abbey Mill House, Colebrook Street, Winchester.

WELLS, BEN, Hardy Plant Nurseries, Merstham, Surrey.

IRIS SOCIETY'S REPRESENTATIVES.

BAKER, G. P., V.M.H., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.

BARR, PETER R., V.M.H., 36 Belsize Park, Hampstead, N.W. 3.

BUNYARD, G. N., F.L.S., 10 Faraday Road, Maidstone, Kent.

HELLINGS, F. WYNN, 12 Upper Park Road, Kingston-upon-Thames, Surrey.

LEVETT, Mrs. G. C., 29 Crescent Road, Kingston Hill, Surrey.

MURRELL, Mrs., c/o Orpington Nursery Co., Orpington, Kent.

PERRY, AMOS, Hardy Plant Farm, Enfield, Middlesex.

PILKINGTON, G. L., Lower Lee, Woolton, Liverpool. (*Secretary, Iris Society.*)

SPENDER, R. E. S., Halshanger, Bagleywood, Oxford.

WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

YELD, G., M.A., V.M.H., Orleton, Austen Wood Common, Gerrard's Cross, Bucks.

The Committee will meet at the following times :

at 11.15 A.M. on the first day of the Fortnightly Meetings on April 2 and 24, May 8, June 4 and 18, July 2 and 16; at the Daffodil Show on Tuesday, April 16; and at the Amateurs' Flower Show, Tuesday, June 25; at 3 P.M. on Tuesday, May 21, at Chelsea; and at 2.15 P.M. at the Iris Society's Show, Thursday, June 6.

Entries must be handed to the Secretary of the Committee at the Chelsea Show by 11.45 A.M.; at the Iris Society's Show by 12 NOON; at other meetings by 10.45 A.M.

On any Show-day, when no meeting of the Joint Committee has been arranged, Irises should be entered with one of the Secretaries of the Floral Committees.

If an Iris is shown with a view to its being selected for trial, one flowering stem is usually sufficient, but in order to obtain an award as a plant for general garden use, as a plant for the rock garden, or as a variety for market, not fewer than three flowering stems must be shown. When entered as a plant for the alpine house an Iris must be represented by a plant or plants carrying not fewer than three flowering stems in all and growing in a pot or a pan, or pots or pans. If exhibited as an ornamental pot-plant the plants must be in pots.

Awards are made to species and first crosses between species when exhibited in London. Irises of garden origin (other than first crosses between species) may receive awards when exhibited in London, if considered suitable for the rock garden, alpine house, or for cultivation as ornamental pot-plants, but those which are entered as suitable for general garden use or for market, if considered worthy, are selected for trial at Wisley, a certificate of Preliminary Commendation being the only award for which they are eligible without trial.

JOINT SWEET PEA COMMITTEE FOR 1935.**CHAIRMAN.**

LEAK, G. W., V.M.H., Flint House, Wisbech, Cambs.

R.H.S. REPRESENTATIVES.

ALLAN, D., c/o Dobbie's Seed Farms, Marks Tey, Essex.

BRIDGEFORD, J. M., 27 Drury Lane, Covent Garden, W.C. 2.

CAMPBELL, D., Park Superintendent's Office, Inner Circle, Regent's Park, N.W. 1.

CRANE, D. B., 50 Cholmeley Crescent, Cholmeley Park, Highgate, N. 6.

DAWKINS, A., 408 King's Road, Chelsea, S.W. 10.

METCALFE, A. W., Luton Hoo Gardens, Luton, Beds.

WILSON, J., The Gardens, Trent Park, New Barnet, Herts.

NATIONAL SWEET PEA SOCIETY'S REPRESENTATIVES.

BARTLETT, A. C., 19 Bedford Chambers, W.C. 2. (*Secretary, National Sweet Pea Society.*)

BOLTON, T., c/o R. Bolton & Son, Birdbrook, Essex.

BURT, G. H., Grange Hill, Coggeshall, Essex.

GOWER, A. W., Calcot Grange Gardens, Reading, Berks.

JANES, E. R., Iwerne, London Road, Reading, Berks.

ROGERS, F. J., St. Hilda, Yarmouth, Isle of Wight.

RUNDLE, C. H., Barton Court Gardens, Canterbury, Kent.

STEVENSON, J., Poole Road, Wimborne, Dorset.

The Committee will meet at the trials at Wisley on receipt of notice.

JOINT RHODODENDRON COMMITTEE FOR 1935.**CHAIRMAN.**

WAKEHURST, Lord, Wakehurst Place, Ardingly, Sussex.

VICE-CHAIRMAN.

WILDING, E. H., Wexham Place, Stoke Poges, Bucks.

R.H.S. REPRESENTATIVES.

BEAN, W. J., I.S.O., V.M.H., 2 Mortlake Road, Kew, Surrey.

CLARKE, Lt.-Col. STEPHENSON R., C.B., J.P., Borde Hill, Haywards Heath, Sussex.

COMBER, J., The Gardens, Nymans, Handcross, Sussex.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

JAMES, The Hon. ROBERT, St. Nicholas, Richmond, Yorks.

OLDHAM, W. R., J.P., Sherwood, Windlesham, Surrey.

PINCKNEY, G. H., c/o John Waterer, Sons & Crisp, Ltd., The Floral Mile, Twyford, Berks.

REUTHE, G., Sunnycroft, 109 Crown Lane, Bromley, Kent.

WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

WILLIAMS, C., M.P., 59 Tufton Street, Westminster, S.W. 1.

RHODODENDRON ASSOCIATION'S REPRESENTATIVES.

ABERCONWAY, Lord, C.B.E., V.M.H., 38 South Street, Mayfair, W. 1.

CROSFIELD, J. J., Embley Park, Romsey, Hants.

GODMAN, Dame ALICE, D.B.E., South Lodge, Horsham, Sussex.

HUTCHINSON, J., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

JENKINSON, Capt. R. C. H., Knap Hill Manor, near Woking, Surrey.

LODER, Lady, Leonardslee, Horsham, Sussex.

LODER, Lt.-Col. GILES H., M.C., High Beeches, Handcross, Sussex.

ROTHSCHILD, LIONEL DE, O.B.E., V.M.H., 18 Kensington Palace Gardens, W. 8.

SLOCOCK, O. C. A., Goldsworth Old Nursery, Woking, Surrey.

STEVENSON, J. B., Tower Court, Ascot, Berks.

WALKER-HENEGE-VIVIAN, Admiral A., C.B., M.V.O., D.L., Clyne Castle, Blackpill, Swansea, Glamorgan.

The Committee will meet at the following times :

at 11.15 A.M. at the Fortnightly Meetings on February 19, March 5 and 19, April 2 and 24, May 8, June 4 and 18 ; at the Daffodil Show on Tuesday, April 16 ; and at the Amateurs' Flower Show on Tuesday, June 25 ; at 12.15 P.M. at the Rhododendron Association's Show on Tuesday, April 30 ; and at 3 P.M. on Tuesday, May 21, at Chelsea.

Entries at the Chelsea Show must be handed to the Secretary of the Committee before 11.45 A.M. ; at other meetings by 10.45 A.M.

On any Show-day, when no meeting of the Joint Committee has been arranged, rhododendrons should be entered with the Secretary of Floral Committee B.

When shown as a plant for general garden use or as a plant for the greenhouse, a cut spray or truss is usually sufficient, but if possible a plant should be shown. At least one plant is required when a rhododendron is shown as suitable for the rock garden or alpine house, and in the latter case the plant must be growing in a pot or pan.

Trials of hardy rhododendrons and azalea hybrids raised by nurserymen, other than the results of first crosses made between species, are carried out at Exbury, and awards to these plants are made only after trial. All other rhododendron hybrids, as well as all species, are eligible for awards when exhibited in London.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE FOR 1935.

CHAIRMAN.

BRIDGEFORD, J. M., 27 Drury Lane, Covent Garden, W.C. 2.

R.H.S. REPRESENTATIVES.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.

CHARRINGTON, E., Ice Wood Cottage, Limpsfield, Surrey.

CHURCHER, Major GEORGE, Beckworth, Lindfield, Sussex.

FAIRLIE, J., 17 Mayfield Road, Acton, W. 3.

GIBSON, J. L., c/o Gibson & Ainos, The Gardens, Cranleigh, Surrey.

NATIONAL CARNATION AND PICOTEE SOCIETY'S REPRESENTATIVES.

GRAY, F. E., 14 Queen's Avenue, Woodford Green, Essex.

KEEN, J. J., 54 The Avenue, Southampton.

KNAPTON, H. A., Rosecroft, Fairfield Road, Orpington, Kent.

MAXFIELD, S., 19B Stone Street, Gravesend, Kent.

WILKINSON, Capt. E. M., Fernbank, Denville, Havant, Hants.

The Committee will meet at the following times :

at 11.30 A.M. at the Fortnightly Meetings on July 2, 16, and 30 ; at 3 P.M. at the National Carnation and Picotee Society's Show on July 23 ; and on notice at such other times as is necessary to deal with entries.

Entries must be handed to the Secretary of the Committee by 11.15 A.M. on any of the named dates, but when it is desired to submit a variety for certificate in any week for which a meeting has not been arranged the completed entry-form must reach the Secretary of the Royal Horticultural Society, or the Secretary of the National Carnation and Picotee Society, by the Tuesday in the preceding week.

To obtain a Preliminary Commendation not fewer than two blooms of a variety must be shown. For an Award of Merit, not fewer than three blooms must be shown and the plant must have flowered in at least two seasons. A First Class Certificate will be awarded only to a variety which has previously received an Award of Merit, and at least seven blooms must be shown. In all cases, whenever possible, a growing plant should also be shown.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE FOR 1935.

CHAIRMAN.

BRIDGEFORD, J. M., 27 Drury Lane, Covent Garden, W.C. 2.

R.H.S. REPRESENTATIVES.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.

CARTER, E. R., Valhalla, Harts Wood Road, Brentwood, Essex.

COOK, L. J., 37 Drapers Road, Enfield, Middlesex.

ENGELMANN, C., Carnation Grower, Saffron Walden, Essex.

INGAMELLS, D., 27 Catherine Street, Covent Garden, W.C. 2.

BRITISH CARNATION SOCIETY'S REPRESENTATIVES.

ALESWORTH, F. W., 17 Avenue Road, Isleworth, Middlesex. (*Secretary, British Carnation Society.*)

JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.

MASON, L., c/o H. T. Mason, Ltd., Eton Lodge, Hampton Hill, Middlesex.

METCALFE, A. W., The Gardens, Luton Hoo, near Luton, Beds.

WALLACE, W. E., J.P., V.M.H., Poplar Farm, Eaton Bray, Dunstable, Beds.

WRIGHT, G. H., The Gardens, North Mymms Park, Hatfield, Herts.

The Committee will meet at the following times :

at 12 NOON at the British Carnation Society's Shows on April 9 and November 19, and at such other times as is necessary to deal with entries.

At the British Carnation Society's Shows entries must be handed to the Secretary of the Committee by 11.30 A.M. When it is desired to submit a variety for certificate at one of the Royal Horticultural Society's Fortnightly Shows, the completed entry-form must reach the Secretary of the Royal Horticultural Society or the Secretary of the British Carnation Society by the Tuesday in the preceding week.

To obtain an Award of Merit, at least three open blooms and one plant in bloom must be shown. No award will be made to a perpetual-flowering carnation until the Committee has seen it twice, once between November 1 and March 1, and once between April 1 and October 31. At least five calendar months must elapse between the dates on which a variety is exhibited. A First Class Certificate may be awarded only to a variety which has previously received an Award of Merit, and only after the Committee has inspected plants in growth between November 1 and March 31. Raisers who wish to enter a variety for a First Class Certificate must notify the Secretary of the Royal Horticultural Society, or the Secretary of the British Carnation Society, so that arrangements may be made for a visit of the Committee.

* * *

JOINT COMMITTEE FOR COMMERCIAL FRUIT TRIALS FOR 1935.

CHAIRMAN.

HALL, Sir DANIEL, K.C.B., F.R.S., LL.D., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.

R.H.S. REPRESENTATIVES.

BEAR, E. M., Fruit Farm, Magham Down, Hailsham, Sussex.

BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.

CHITTENDEN, F. J., F.L.S., V.M.H., R.H.S. Hall, Vincent Square, S.W. 1.

NEAME, THOMAS, The Offices, Macknade, Faversham, Kent.

SMITH, CUTHBERT, Elm House, Boughton Monchelsea, Maidstone, Kent.

MINISTRY OF AGRICULTURE AND FISHERIES' REPRESENTATIVES.

BARKER, Prof. B. T. P., M.A., University of Bristol Research Station, Long Ashton, Bristol.

FRYER, J. C. F., O.B.E., Pathological Laboratory, Milton Road, Harpenden, Herts.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.

LOBJOIT, Sir WILLIAM G., O.B.E., J.P., V.M.H., Oakdene, Wooburn, High Wycombe, Bucks.

TAYLOR, H. V., O.B.E., B.Sc., Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W. 1.

EXHIBITION COMMITTEE FOR 1935.

CHAIRMAN.

MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.

VICE-CHAIRMEN.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.

MONRO, G., C.B.E., V.M.H., 4 Tavistock Street, Covent Garden, W.C. 2.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.
 BECKETT, E., V.M.H., Grove House, Park Road, Radlett, Herts.
 BUNYARD, G. N., F.L.S., 10 Faraday Road, Maidstone, Kent.
 ELLIOTT, CLARENCE, Six Hills Nursery, Stevenage, Herts.
 FIFE, WILLIAM, c/o Dobbie & Co., Ltd., Edinburgh.
 HARVEY-CANT, F. S., Braiswick Rose Gardens, Colchester, Essex.
 HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.
 LANGDON, C. F., Twerton Hill Nursery, Bath, Somerset.
 NIX, C. G. A., V.M.H., Tilgate, Crawley, Sussex.
 RIDING, JAS. B., The Nurseries, Chingford, E. 4.
 RUSSELL, L. R., V.M.H., Richmond Nurseries, Richmond, Surrey.
 SANDER, FREDERICK K., The Camp, St. Albans, Herts.
 SUTTON, L. NOEL, Hillside, Reading, Berks.
 WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.
 WOOD, A. J., c/o Wm. Wood & Son, Ltd., Taplow, Bucks.

BOARD OF EXAMINERS FOR 1935.

Horticultural Examinations.

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ABBISS, H. W., N.D.H., Horticultural Supt., County Hall, Truro, Cornwall.
 BARRATT, Dr. KATE, C.B.E., The Horticultural College, Swanley, Kent.
 BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Waltham Cross, Herts.
 BURGESS, A. E., M.B.E., 215 Park Road, Kingston Hill, Surrey.
 CHITTENDEN, F. J., F.L.S., V.M.H., R.H.S. Offices, Vincent Square, S.W. 1.
 DARLINGTON, H. R., M.A., F.L.S., Park House, Potters Bar, Middlesex.
 DURHAM, F. R., C.B.E., M.C., R.H.S. Offices, Vincent Square, S.W. 1.
 HALES, W., A.L.S., V.M.H., Chelsea Physic Garden, S.W. 3.
 PETTIGREW, W. W., V.M.H., Winryl, East Close, Middleton, Bognor Regis, Sussex.
 TAYLOR, H. V., O.B.E., B.Sc., Ministry of Agriculture and Fisheries, S.W. 1.

British Floral Art Diploma Examinations.

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BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.

VICE-CHAIRMAN.

MONRO, G., C.B.E., V.M.H., 4 Tavistock Street, Covent Garden, W.C. 2.

ANLEY, Mrs., St. George's, Wych Hill Lane, Woking, Surrey.
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 DARLINGTON, H. R., M.A., F.L.S., Park House, Potters Bar, Middlesex.
 FURNISS, Mrs., c/o London Gardens, 118-120 Knightsbridge, S.W. 1.
 GALSWORTHY, F., Green Lane Farm, Chertsey, Surrey.

HAMMOND, C. J., 27 The Crossways, Wembley Park, Middlesex.
 JAMES, The Hon. ROBERT, St. Nicholas, Richmond, Yorks.
 JOLIS, H., 12 Sloane Square, S.W. 1.
 YARDE, Capt. CYRIL, c/o Yarde & Co., Florists and Nurserymen, Northampton.

WISLEY ADVISORY COMMITTEE FOR 1935.

THE COUNCIL and

- *BLACKMAN, Prof. V. H., M.A., Sc.D., F.R.S., Imperial College of Science, S.W. 7.
- *BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.
- CLARKE, Lt.-Col. STEPHENSON R., C.B., J.P., Borde Hill, Haywards Heath, Sussex.
- FENWICK, MARK, J.P., Abbotswood, Stow-on-the-Wold, Glos.
- *FRYER, J. C. F., O.B.E., Pathological Laboratory, Milton Road, Harpenden, Herts.
- *HALL, Sir DANIEL, K.C.B., F.R.S., LL.D., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.
- HANBURY, F. J., F.L.S., F.R.E.S., V.M.H., Brockhurst, East Grinstead, Sussex.
- *HILL, Sir ARTHUR, K.C.M.G., Sc.D., F.R.S., F.L.S., V.M.H., Royal Botanic Gardens, Kew, Surrey.
- JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.
- LOBJOIT, Sir WILLIAM G., O.B.E., J.P., V.M.H., Oakdene, Wooburn, High Wycombe, Bucks.
- NOTCUTT, R. C., Woodbridge, Suffolk.
- *RAMSBOTTOM, J., O.B.E., M.A., F.L.S., British Museum (Natural History), Cromwell Road, S.W. 7.
- *RENDLE, A. B., M.A., D.Sc., F.R.S., F.L.S., V.M.H., Talland, The Mount, Fetcham Park, Leatherhead, Surrey.
- TAYLOR, H. V., O.B.E., B.Sc., Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W. 1.
- *WEISS, Prof. F. E., D.Sc., LL.D., F.R.S., F.L.S., Easedale, Woodway, Merrow, near Guildford, Surrey.

* Wisley Advisory Scientific Sub-Committee for 1935.

PUBLICATIONS COMMITTEE FOR 1935.

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STEVENSON, J. B., Tower Court, Ascot, Berks.

VICE-CHAIRMEN.

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 WAKEHURST, Lord, Wakehurst Place, Ardingly, Sussex.

BAKER, G. P., V.M.H., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.
 BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Waltham Cross, Herts.
 BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.
 HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.
 HILL, Sir ARTHUR W., K.C.M.G., M.A., Sc.D., F.R.S., F.L.S., V.M.H., Royal Botanic Gardens, Kew, Surrey.
 MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.
 RENDLE, A. B., M.A., D.Sc., F.R.S., F.L.S., V.M.H., Talland, The Mount, Fetcham Park, Leatherhead, Surrey.
 STERN, Major, F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.
 STOKER, Dr. FRED, F.L.S., The Summit, Golding's Hill, Loughton, Essex.
 TROTTER, R. D., Leith Vale, Ockley, Surrey.

LIBRARY COMMITTEE FOR 1935.

CHAIRMAN.

BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.

VICE-CHAIRMAN.

BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Waltham Cross, Herts.

COTTON, A. D., O.B.E., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

GROVE, A., F.L.S., V.M.H., 2 Albion Street, W. 2.

HANBURY, F. J., F.L.S., F.R.E.S., V.M.H., Brockhurst, East Grinstead, Sussex.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

MESSEL, Lt.-Col. L. C. R., O.B.E., Nymans, Handcross, Sussex.

SAVAGE, S., The Linnean Society, Burlington House, W. 1.

WAKEHURST, Lord, Wakehurst Place, Ardingly, Sussex.

LILY COMMITTEE FOR 1935.

CHAIRMAN.

STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.

VICE-CHAIRMAN.

COTTON, A. D., O.B.E., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey

GROVE, A., F.L.S., V.M.H., 2 Albion Street, W. 2.

SIMMONDS, A., N.D.H., R.H.S. Offices. (*Secretary.*)

ABERCONWAY, Lord, C.B.E., V.M.H., 38 South Street, Mayfair, W. 1.

AMSLER, Dr. M., Eton Court House, Eton, Windsor, Berks.

BEVAN, ROGER, 103 Gloucester Place, Portman Square, W.

COMBER, J., The Gardens, Nymans, Handcross, Sussex.

CONSTABLE, W. A., Trotting Hill, Southborough, Tunbridge Wells, Kent.

COUTTS, J., V.M.H., Royal Botanic Gardens, Kew, Surrey.

CURTIS, C. H., F.L.S., V.M.H., 24 Boston Road, Brentford, Middlesex.

DILLISTONE, G., 50 Claremont Road, Tunbridge Wells, Kent.

FENWICK, MARK, J.P., Abbotswood, Stow-on-the-Wold, Glos.

HARLEY, ANDREW, Blinkbonny, Kirkcaldy, Fifeshire.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

JAMES, The Hon. ROBERT, St. Nicholas, Richmond, Yorks.

JENKINSON, Capt. R. C. H., Knap Hill Manor, nr. Woking, Surrey.

NAPIER, Lt.-Col. GEORGE S. F., Little London, Horeham, Sussex.

Ogilvie, L., M.A., M.Sc., Research Station, Long Ashton, Bristol.

PERRY, AMOS, Hardy Plant Farm, Enfield, Middlesex.

ROSE, F. J., Townhill Park Gardens, West End, Southampton.

ROSENHEIM, PAUL, 27 Spencer Road, East Molesey, Surrey.

SCRASE-DICKINS, C. R., M.A., D.L., V.M.H., Coolhurst, Horsham, Sussex.

SMITH, Sir WILLIAM WRIGHT, M.A., F.L.S., V.M.H., Royal Botanic Garden, Edinburgh, 4.

SPENDER CLAY, Mrs. H., Ford Manor, Lingfield, Surrey.

STANLEY, Lady BEATRIX, 8 Little College Street, S.W. 1.

STOKER, Dr. FRED, F.L.S., The Summit, Golding's Hill, Loughton, Essex.

STOOKE, J. E. H., Danesmere, Hereford.

TAYLOR, G. M., Links Cottage, Longniddry, East Lothian.

TROTTER, R. D., Leith Vale, Ockley, Surrey.

WALLACE, R. W., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

WOODCOCK, Judge H. DRYSDALE, K.C., County Court, Leeds, York.

CORRESPONDENTS OF THE LILY COMMITTEE.

- ATCHLEY, S. C., British Legation, Athens, Greece.
CALDER, C. C., B.Sc., F.L.S., Royal Botanic Garden, Sibpur, nr. Calcutta, India.
CRAIG, WILLIAM N., Front Street at Federal, Weymouth 88, Mass., U.S.A.
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LEMPERG, Dr. F., Hatzendorf, Austria.
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PRESTON, Miss I., Central Experimental Farm, Ottawa, Canada.
PURDY, CARL, Ukiah, California, U.S.A.
SOUILLET, L'ABBÉ H., Curé de Milly par Gennes, Maine et Loire, France.
STOUT, Dr. A. B., The New York Botanical Garden, Bronx Park (Fordham Branch P.O.), New York, U.S.A.
STOYANOFF, Prof. N., Sofia University, Agricultural Faculty, Sofia, Bulgaria.
UNGER, ALFRED, Heidelberg-Schlierbach, Germany.
VOLLMER, Dr. A. M., 384 Post Street, San Francisco, U.S.A.
WARD, F. KINGDON, V.M.H., Hatton Gore, Harlington, Middlesex.

VICTORIA MEDAL OF HONOUR IN HORTICULTURE.—V.M.H.

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 1933 BAKER, G. P., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.
 1927 BALFOUR, F. R. S., M.A., D.L., J.P., 13 Collingham Gardens, S.W. 5.
 1924 BARNES, N. F., The Gardens, Eaton Hall, Ch. iter.
 1931 BARR, P. R., 36 Belsize Park, Hampstead, N.W. 3.
 1923 BARTHOLOMEW, A. C., 75 Tilehurst Road, Reading.
 1917 BEAN, W. JACKSON, I.S.O., 2 Mortlake Road, Kew, Surrey.
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 1932 BLISS, D., Parks Department, 4 Mount Street, Swansea, Glam.
 1922 BOSCAWEN, Rev. Canon ARTHUR T., Ludgvan Rectory, Cornwall.
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 1933 COUTTS, J., 43 The Green, Kew, Surrey.
 1930 CURTIS, C. H., F.L.S., 24 Boston Road, Brentford, Middlesex.
 1931 DALLIMORE, W., Hanover House, The Green, Kew, Surrey.
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 1922 FRASER, JOHN, F.L.S., 355 Sandycombe Road, Kew.
 1924 GROVE, A., F.L.S., 2 Albion Street, W.
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 1926 HARROW, R. L., R.H.S. Gardens, Wisley, Ripley, Surrey.
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 1924 HAY, THOMAS, M.V.O., New Lodge, Hyde Park, W. 2.
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 1930 HORT, Sir ARTHUR, Bt., Hurstbourne Tarrant, Andover.
 1930 JORDAN, F., Yewdene, Edenbridge, Kent.
 1932 LAXTON, E. A. L., 63 High Street, Bedford.
 1930 LEAK, G. W., Flint House, Lynn Road, Wisbech.
 1932 LOBJOIT, Sir WILLIAM G., O.B.E., J.P., Oakdene, Wooburn, High Wycombe, Bucks.
 1929 McLEOD, J. F., Leven House, Milnathort, Kinross.
 1928 MALCOLM, ALEXANDER, Blackadder Bank, Chirnside, Berwickshire.
 1917 MAXWELL, Rt. Hon Sir HERBERT E., Bt., K.T., P.C., D.C.L., LL.D., F.R.S., Monreith, Wigtown.
 1910 MAY, HENRY B., Pteris House, 6 Endlebury Road, Chingford, E. 4.
 1932 MILLARD, F. W., Camla Gardens, Copthorne Road, Felbridge, East Grinstead, Sussex.
 1934 MONRO, G., C.B.E., 4 Tavistock Street, Covent Garden, W.C. 2.
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 1926 MUSGRAVE, C. T., Olivers, Hascombe, Godalming, Surrey.
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 1926 PETTIGREW, W. W., Winryl, East Close, Middleton, Bognor Regis, Sussex.
 1922 POUPART, WILLIAM, Ferndale, Rydens Road, Walton-on-Thames.
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 1917 RENDLE, A. B., M.A., D.Sc., F.R.S., F.L.S., Talland, The Mount, Fetcham Park, Leatherhead.
 1897 ROTHSCHILD, Lord, M.A., Ph.D., F.R.S., F.L.S., Tring Park, Herts.
 1929 ROTHSCHILD, LIONEL DE, O.B.E., 18 Kensington Palace Gardens, S.W. 8.

- 1929 RUSSELL, L. R., Richmond Nurseries, Richmond, Surrey.
1934 SCRASE-DICKINS, C. R., M.A., D.L., Coolhurst, Horsham, Sussex.
1933 SHAWYER, GEORGE, The Nurseries, Uxbridge, Middlesex.
1925 SMITH, Sir WILLIAM WRIGHT, M.A., F.L.S., Royal Botanic Gardens, Edinburgh.
1923 WALLACE, ROBERT W., J.P., The Old Gardens, Tunbridge Wells.
1926 WALLACE, W. E., J.P., The Nurseries, Eaton Bray, Dunstable.
1932 WARD, Capt. F. KINGDON, Hatton Gore, Harlington, Middlesex.
1926 WATKINS, A., c/o Watkins & Simpson, Ltd., 27 Drury Lane, W.C. 2.
1920 WHITE, EDWARD, 7 Victoria Street, S.W.
1927 WHITE, H., Sunningdale Nurseries, Windlesham, Surrey.
1927 WILLIAMS, P. D., Lanarth, St. Keverne, R.S.O., Cornwall.
1925 YELD, G., M.A., Orleton, Austen Wood Common, Gerrard's Cross.

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1907 BALLANTINE, HENRY (d. 1929).
1897 BARR, PETER (d. 1909).
1897 BARRON, ARCHIBALD F. (d. 1903).
1901 BATESON, WILLIAM, D.Sc., F.R.S. (d. 1926).
1907 BEALE, EDWARD JOHN, F.L.S. (d. 1902).
1902 BENNETT-POE, JOHN T., M.A. (d. 1926).
1897 BOXALL, W. (d. 1910).
1897 BULL, WILLIAM, F.L.S., (d. 1902).
1897 BUNYARD, GEORGE (d. 1919).
1897 BURBIDGE, FREDERICK W., M.A., F.L.S. (d. 1905).
1902 CANNELL, HENRY (d. 1914).
1904 CHALLIS, THOMAS (d. 1923).
1902 COOKE, Dr. M. C., M.A., LL.D. (d. 1914).
1911 COOMBER, THOMAS (d. 1926).
1918 CRISP, Sir FRANK (d. 1919).
1897 CRUMP, WILLIAM (d. 1932).
1914 CUTHBERTSON, Wm. (d. 1934).
1910 CYPHER, J. J. (d. 1928).
1904 DEAN, ALEXANDER (d. 1912).
1897 DEAN, RICHARD (d. 1905).
1925 DICKS, S. B. (d. 1926).
1907 DICKSON, GEORGE (Newtownards) (d. 1914).
1897 DICKSON, GEORGE (Chester) (d. 1909).
1897 D'OMBRAIN, Rev. H. H., M.A. (d. 1905).
1899 DOUGLAS, JAMES (d. 1911).
1897 DRURY, CHARLES T., F.L.S. (d. 1917).
1897 DUNN, MALCOLM (d. 1899).
1925 DYKES, W. R., M.A., LL.D. (d. 1925).
1905 ECKFORD, HENRY (d. 1905).
1897 ELLACOMBE, Rev. Canon (d. 1916).
1897 ELWES, HENRY J., F.R.S., F.L.S. (d. 1922).
1903 FENN, ROBERT (d. 1912).
1921 FORREST, GEORGE (d. 1932).
1897 FOSTER, Sir MICHAEL, K.C.B., F.R.S. (d. 1907).
1897 FRASER, JOHN (d. 1900).
1916 GIBBS, The Hon. VICARY (d. 1932).
1909 GOODACRE, JAMES H. (d. 1922).
1897 GORDON, GEORGE (d. 1914).
1903 HANBURY, Sir THOMAS, K.C.V.O., F.L.S. (d. 1907).
1897 HEAL, JOHN (d. 1925).
1909 HEMSLEY, Dr. W. B., F.R.S., F.L.S. (d. 1924).
1906 HENRY, Prof. AUGUSTINE, M.A., F.L.S. (d. 1930).
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1897 HERBST, HERMANN (d. 1904).
1897 HOLE, The Very Rev. S. REYNOLDS, Dean of Rochester (d. 1904).
1897 HOOKER, Sir JOSEPH, G.C.S.I., C.B., O.M., F.R.S. (d. 1911).
1897 HORNER, Rev. F. D., M.A. (d. 1912).
1897 HUDSON, JAMES (d. 1932).
1897 JERVELL, Miss GERTRUDE (d. 1932).
1897 JONES, H. J. (d. 1928).
1897 KAY, PETER E. (d. 1909).
1909 KER, R. WILSON (d. 1910).
1901 KING, Sir GEORGE, K.C.I.E., F.R.S., F.L.S. (d. 1909).
1897 LAING, JOHN (d. 1900).
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1900 LAWRENCE, Sir TREVOR, Bt., K.C.V.O. (d. 1913).
1929 LAWRENCE, Sir WILLIAM, Bt. (d. 1934).
1907 LLEWELYN, Sir JOHN T. D., Bt., F.L.S. (d. 1927).
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1920 MCHATTIE, J. W. (d. 1923).
1897 MCINDOE, JAMES (d. 1910).
1909 MACKELLAR, A. C. (d. 1931).
1897 MARIES, CHARLES, F.L.S. (d. 1902).
1906 MARSHALL, WILLIAM, F.E.S. (d. 1917).
1902 MASSEE, GEORGE, F.L.S. (d. 1917).
1904 MAWLEY, EDWARD, F.R.M.S. (d. 1916).
1927 MILLAIS, J. G. (d. 1931).
1897 MILNER, HENRY ERNEST, F.L.S. (d. 1906).
1897 MOLYNEX, EDWIN (d. 1921).
1897 MONRO, GEORGE (d. 1920).
1925 MOORE, G. F. (d. 1927).
1897 MORRIS, Sir DANIEL, K.C.M.G. (d. 1933).
1924 MORRIS, SYDNEY (d. 1924).
1925 MOUNT, GEORGE (d. 1927).
1897 NICHOLSON, GEORGE, F.L.S. (d. 1908).
1901 NORMAN, GEORGE (died 1906).
1897 O'BRIEN, JAMES (d. 1930).
1901 ORMEROD, Miss E. A., LL.D. (d. 1901).
1897 PAUL, GEORGE, J.P. (d. 1921).
1897 PAUL, WILLIAM, F.L.S. (d. 1905).
1911 PEARSON, ALFRED H., J.P. (d. 1930).
1924 PEARSON, CHARLES E. (d. 1929).
1914 PINWILL, Capt. W. (d. 1926).
1904 REDSDALE, Lord, G.C.V.O., C.B. (d. 1916).
1897 RIVERS, T. FRANCIS (d. 1899).
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1917 ROLLE, Sir ALBERT KAYE, D.C.L., LL.D. (d. 1922).
1908 ROSS, CHARLES (d. 1917).
1897 SANDER, FREDERICK, F.L.S. (d. 1920).
1897 SCHRÖDER, Baron Sir HENRY, Bt., C.V.O. (d. 1910).
1897 SEDEN, JOHN (d. 1920).
1897 SHERWOOD, N. N. (d. 1916).
1916 SLOOOCK, W. C. (d. 1926).
1897 SMITH, JAMES (d. 1903).
1897 SMITH, MARTIN R. (d. 1908).
1906 SMITH, THOMAS (d. 1919).
1897 SPEED, WALTER (d. 1921).
1927 STAFF, Dr. O., F.R.S., F.L.S. (d. 1933).
1897 SUTTON, A. W., J.P., F.L.S. (d. 1925).
1901 SWEET, JAMES (d. 1924).
1926 THEOBALD, Prof. F. V., M.A., F.E.S. (d. 1930).
1897 THOMAS, OWEN (d. 1923).
1897 THOMPSON, WILLIAM (d. 1903).
1897 THOMSON, DAVID (d. 1906).
1897 TURNER, HARRY (d. 1906).
1906 VEITCH, Sir HARRY J., F.L.S. (d. 1924).
1916 VEITCH, P. C. M., J.P. (d. 1929).
1916 WATSON, W., A.L.S. (d. 1925).
1927 WHITE, J. T. (d. 1930).
1912 WHITTON, J. (d. 1925).
1914 WHYTOCK, JAMES (d. 1926).
1912 WILKS, Rev. WILLIAM, M.A. (d. 1923).
1897 WILLMOTT, Miss E., F.L.S. (d. 1934).
1912 WILSON, Dr. E. H., M.A. (d. 1930).
1897 WILSON, G. F., F.R.S., F.L.S. (d. 1902).
1897 WOLLEY DOD, Rev. C., M.A. (d. 1904).
1897 WRIGHT, JOHN (d. 1916).
1920 WRIGHT, SAMUEL T. (d. 1922).
1897 WYTHES, GEORGE (d. 1916).

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TREES FOR THE SMALL PARK AND GARDEN.

By Capt. R. C. JENKINSON.

[Read October 23, 1934 ; Mr. MARK FENWICK in the Chair.]

I AM grateful to the selectors of the title of this paper for giving me such a wide reference, for the number of trees from which to make our choice has been so much enlarged by the introductions of the past twenty-five years, that there is bound to be much divergence of opinion. I speak with limited knowledge, and only as a result of personal observation, and I have no doubt that many of you will disagree with my taste, and lament my omissions.

Before embarking on my list, I would ask anyone who contemplates planting a tree to do two things : first to look it up in Mr. Bean's invaluable volumes *Trees and Shrubs Hardy in the British Isles*, where the ultimate height and proper character of the plant can be ascertained. It is foolish to plant a tree which will only be in its full splendour when it is 60 or more feet high, in a position which should be occupied by a small tree such as one of the *Pyrus* of 25 feet ; and trees are not like Dahlias, they cannot be dug up every year and moved about according to your taste. Therefore, and this is my second point, look at the situation which your tree is to occupy most carefully from every aspect : think how it will look in its maturity in relation to the surrounding plants and landscape ; think how it is going to fit in with the existing trees. Spring-flowering trees, or those which are planted for their autumn effects, are generally shown off to the best advantage where they have a dark background of conifers. On the other hand,

nothing is lovelier than a group of common Geans standing by themselves in a park.

To my mind the Maples are amongst the most decorative trees which we can plant. Nearly all of them colour well in the autumn ; some are valuable in the winter for the colour of their bark, while some, like *Acer japonicum laciniatum*, are beautiful when bearing their ruby-red flowers. The last makes a small tree some 20 feet high, and whatever the vagaries of the season may be, invariably flares up orange and scarlet during October. A species which has been much talked about lately, and justly so, is *A. griseum*. It has not grown to more than 20 feet in this country, but will probably get up to double that size in time ; it is a plant which requires careful pruning as a youngster, or it will make two or three leaders, and become unbalanced and bushy rather than tree-like in character. One of its greatest charms is its peeling cinnamon-orange bark, and to show this off to best advantage the lower branches should be pruned off as the tree grows up to give it a clean leg of at least 6 feet. It belongs to the trifoliate group, amongst which it is described by Mr E. H. WILSON as being the most striking species, for its peeling bark as well as the brilliant fading foliage. A close relation in this same group is *A. nikoense* from Japan. This is a faster growing plant with larger leaves which turn rich rosy-red. I have never seen this plant doing well in a limey soil ; indeed two of the best Maples for a really acid soil are this, and *A. pennsylvanicum*, the 'Snake Bark Maple' of North America. This is a quick growing tree of some 30 feet with an attractive green and white striped trunk, with large three-lobed leaves turning to a good yellow before they fall. There are two or three of these striped barked Maples, which have been more recently introduced, such as *A. Davidi* and *A. rufinerve*, and for those of us who like something attractive in our gardens during the so-called dead season, they are very valuable plants. I must not talk about Maples for too long, but I cannot leave the genus without calling your attention to *A. circinatum*, a Western American species. I saw a memorable planting of this the other day in a cold garden 700 feet above sea-level in the South of Scotland. There were great groups of it planted up and down a shallow glen backed by magnificent conifers, and one has only to see it in these surroundings to realize what a glorious plant it is.

While we are thinking about trees which are valuable for their bark, I should like to draw your attention to two or three of the newly introduced Birches. While no one could claim that they, or for that matter any other tree, are lovelier than our common Silver Birch, they are extraordinarily attractive. *Betula japonica szechuanica* looks like being one of the best, and is a really good grower, with a creamy bark sometimes tinted with pink, and another good one is *B. Ermannii* from Manchuria and Korea, with a bark of the same creamy colour. If these can be planted in small groups against a dark green background, their effect in the pale winter sunlight is extraordinarily beautiful. Another first-class Birch is *B. Maximowiczii*, which has the largest

leaves of the family, up to 6 inches long, with a bright creamy-orange trunk. It is a hardy quick-growing species of rather stiff habit, and with its long female catkins, is one of the best of its family.

America has provided us with some of the best autumn colouring trees we have. To my mind, nothing is better than the 'Tupelo,' *Nyssa sylvatica*, from the Eastern States. I think it is happiest growing in a fairly moist soil in full sun, where the ground is shaded by shrubs. It makes a tree of 100 feet in its native haunts, but in this country is generally not more than 60 feet high, and when its leaves turn every sort of flame and scarlet in the autumn there are few plants to compare to it. I think a good companion for it would be *Eucryphia pinnatifolia*, a Chilean visitor which has mercifully come to stay, for it is perfectly happy in any garden that is not cursed—or blessed—by lime, where it has not to stand the full blast of the wind. How high it will eventually grow, I do not know—perhaps 30 feet. It was introduced by Messrs. J. VEITCH in 1859, and I am not alone in thinking it the finest plant that that great firm ever introduced. It is evergreen or semi-deciduous, erect growing, with dark shining green pinnate leaves, and has the rare merit of flowering in July and August. The flowers are borne in the greatest profusion, rather like single white Roses, four petalled, with a bunch of yellow anthers, and those who have seen the magnificent bushes of it growing in a famous garden in North Wales in their full August beauty, will not easily forget the sight.

A stately tree which is too little planted, is *Cladrastis tinctoria*, the 'Yellow Wood' of North America. It grows to 50 or 60 feet, and has fine bright green pinnate leaves which turn yellow in the autumn. I remember two or three years ago walking along a dark sombre path in the Arboretum at Westonbirt, lined by fine specimens of Cupressus, and I think, Libocedrus, and as we came round a bend, we were hit in the eye by a sheet of gold, which turned out to be a fine specimen of *Cladrastis* with the autumn sun shining on it. From the same country come three other trees which, though they have little beauty in flower, make very stately specimens. They are *Liquidambar styraciflua*, *Liriodendron tulipifera*, and *Magnolia acuminata*. The last of the three, the Magnolia, a tree of some 70 feet, has large oval leaves; as a young plant it is rather erect growing, but at maturity the branches arch outwards. *Liquidambar styraciflua* and *Liriodendron tulipifera* grow from 80 to 100 feet high, the latter turning in the autumn to pale yellow, while the former according to the season, and the soil in which it is planted, will go either bright orange or deep claret. All these three are best planted where they will not be crowded by other trees; they want room to develop to show their shapeliness and dignity. Magnolias are thought of by most people as shrubs, but two or three more of them make lovely small trees. The Yulan, *Magnolia conspicua*, will grow upwards of 40 feet. It is deciduous and bears its flowers at the end of March or early April on the naked shoots; they are pure white, with petals about 3 inches long, and are deliciously scented. It is very free flowering, but it comes into bloom so early that it should

be protected from our cold spring east winds. *M. officinalis* is a magnificent tree. It will grow to 70 feet high with large leathery leaves about a foot long and half as wide. The flowers are creamy-white, with bright purple stamens, and sweetly scented, about 8 inches across, and they come in June. It is a very fast grower, and perfectly hardy, and although it does not flower until it is 20 or 30 feet high, it is a tree which I most strongly recommend.

Next let us think about some of the Cherries. Without them our gardens would lack one of their greatest spring charms. Some of the Japanese forms have names as impossible to pronounce as the varieties are to distinguish apart, but all are lovely small trees either for grouping in the distance in front of a dark evergreen background, or used as single specimens on a lawn. About the strongest grower, and without a superior amongst the double pinks, is one called 'Sekiyama.' The young foliage is bronzy, and colours well in the autumn, and its flowers are pure rose-pink. Then there is the pale yellow form called *grandiflora*: this I like best planted away from other Cherries, either with dark purple Lilac or some of the red-leaved forms of the Japanese Maples, to throw up the delicate tint of its flowers. If I had to pick one out of the many good whites, I should select 'Miyako' with double flowers hanging down on long stalks and rather a spreading habit. It is one of the latest Cherries to flower, and every year it is literally smothered in bloom. Next and last I would call your attention to 'Ama-no-gawa:' this forms an absolutely perpendicular tree, like a Lombardy Poplar, and has pale pink double flowers.

Far too little use is made of these erect-growing trees. By planting them in small gardens, you can get the effect of height without encumbering the ground with a wide spread of branches which prevents any other planting, and for use in avenues or long drives they are invaluable. One of the best fastigate trees is the Dawyck Beech. This was found wild many years ago in the woods near Dawyck, in Peeblesshire. It is perfectly formal and upright with no tendency to sport back into the arching habit of the common Beech. *Libocedrus decurrens* is another tree of this type; it comes from Chile, is perfectly hardy, with bright green foliage, and is the finest erect-growing conifer ever introduced. I can imagine no better piece of planting than an open amphitheatre at the edge of a woodland, outlined with these three trees, the Cherry, the Beech and the conifer. To get back to the Cherries, *Prunus Sargentii* is now beginning to get well known, and I should like to see it as freely planted all over the British Isles as our common May. It will make a tree of 40 or 50 feet. The young foliage is copper coloured, and at the moment of writing its turning leaves provide the most glowing piece of colour that any garden can show. It blooms in March or April, with lovely pale pink flowers about an inch and a half across, very freely produced. It was introduced by Professor SARGENT from Japan towards the end of the last century, and nothing more beautiful was ever sent to us from that country. There it is the best of the genus as a timber tree. I wonder

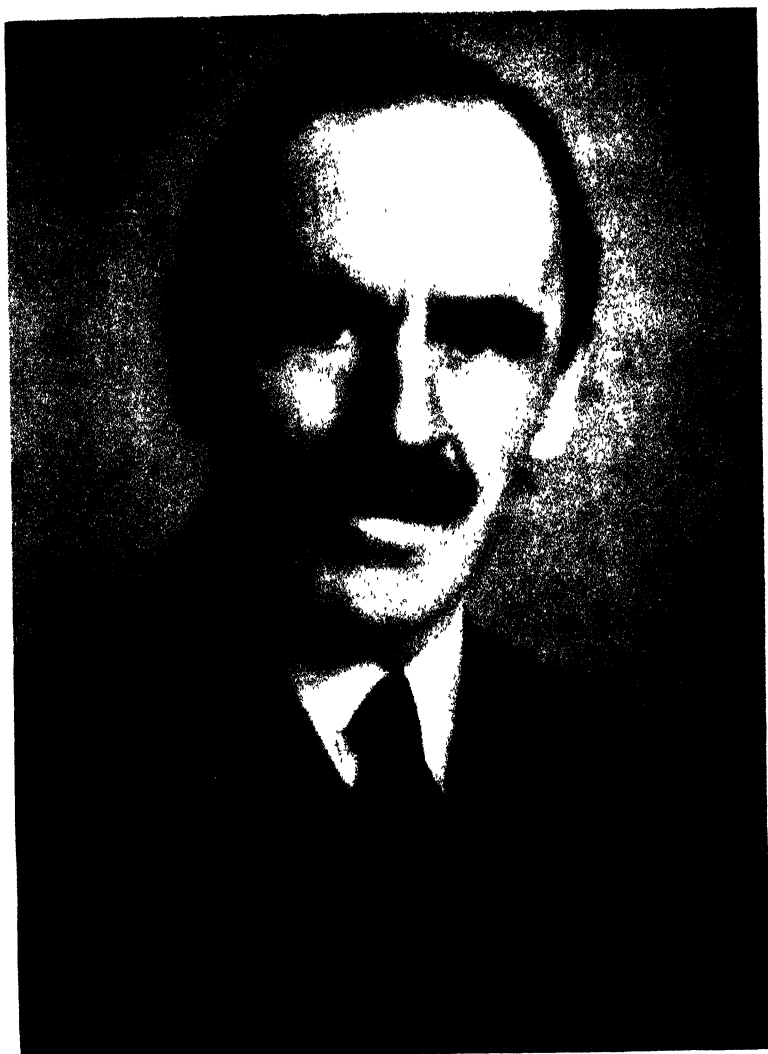


FIG 1 —THE LATE MR. REGINALD CORY, F.L.S.
Member of Council 1922-31.
(See pp. 1 and v.)

[To face p. 64.]

if anyone has ever planted it for that purpose in this country? Certainly a hill-side planted with this Cherry and conifers would be worth going many miles to see. I was much impressed last February or March by *Prunus Davidiana*. It belongs to the Peach section of this comprehensive genus, and was introduced by the Abbé DAVID from China; because of its early-flowering habit it may be spoilt if snow or hard frosts descend upon us when the buds are opening, but it is a very lovely tree and well worth planting. The flowers are about an inch across, pure white, or, in the variety *rubra*, pale pink, and it is a first-class plant to cut for the house. Sprays should be cut just before the buds open, when they will last a week or ten days. It will grow up to 20 feet and is best planted sheltered from the east. We usually think of Cherries only for their flower, but *Prunus serrulata tibetica* relies on the beauty of its bark, which is a shining reddish-brown. It makes a little tree of about 20 feet, and to show off this bark, it should be treated like *Acer griseum*, and have its lower branches cut off. It is then one of the loveliest trees for a winter garden.

I am diffident about selecting trees from the various *Pyrus*, where all are good. This family embraces some very distinct sections. All the Mountain Ashes, varying in the colour of their fruits and the size of their pinnate leaves, are attractive and useful, quite hardy, and quick growing. As far as I can see they have only one disadvantage, birds have a passion for their berries, and at least in some localities fruiting trees will be denuded in three or four days. They all colour well in the autumn, and make neat, graceful trees. Of the white-fruited forms, *Sorbus hupehensis* is first class, growing into a biggish tree of 30 or 40 feet, while *S. munda* variety *sub-arachnoidea* is a much smaller mushroom-shaped tree with neater and smaller leaves. Of those which bear red fruits, were I confined to one, I should select *S. Esserteauiana*; the fruit is so bright and so freely produced, and in addition to this, the glaucous downy young foliage is most attractive. Amongst the Crab Apples, there are several good hybrids, such as *Malus Eleyi*, *M. Lemoinei*, and 'Aldenham Purple,' with flowers of some shade of purplish-red, and dark red foliage, all lovely spring-flowering plants, which in this month are laden with crimson crabs. I am very fond of *M. coronaria*; it has rather large blush-pink flowers, most deliciously scented of violets. It comes from Eastern North America, and flowers later than most of this family, at the end of May or June, and is most profuse after a hot summer when its wood has been thoroughly ripened. Another first-class Crab is *M. theifera*, with large white flowers, sweetly scented, which cover the tree in April. The fruits are small, yellow flushed with red. All these Crabs will grow anywhere in any position, and are equally attractive whether they are given an isolated position on a lawn or planted in small groups and allowed to run into each other. There is a Pear which might, I think, be more freely used, *Pyrus salicifolia pendula*. It throws out long weeping branches clothed with silver

Willow-like leaves, and has small bunches of white flowers, and for those who like glaucous foliage plants—and I am one—this is a good tree, growing up to 20 to 30 feet. It makes a most effective background for the lovely rosy-mauve goblets of *Magnolia Lennei*. Now for the last section of this heterogeneous family, the White Beams. They form shapely trees of 40 or 50 feet or more. The Himalayan *Sorbus vestita* is valuable, with its large oval grey leaves, covered when young with a white wool, while *S. pinnatifida* has greyish cut foliage. They all have white flowers, and red, or reddish-brown, fruits, and are useful trees to mix with the dark foliage of conifers and the true greens of other deciduous trees.

Now we come to the Oaks, and where many are good, I will select two: first the Hungarian Oak, *Quercus conferta*, a stately tree which, in South-Eastern Europe, grows up to 100 feet, with lustrous green leaves, deeply and more or less regularly lobed; it grows well in this country, and is in every way a first-class tree. Secondly, I would select *Q. coccinea* from Eastern North America, introduced about 150 years ago. Its leaves turn the best pure scarlet of almost any tree, and are retained until November or December. It grows 70 or 80 feet high. The best form is considered to be one named *splendens*; all trees of this form have, of course, to be grafted, and while it is all very well for growing in gardens, I would prefer to select the best colouring forms out of a batch of seedlings for planting out in parks. The seedlings get away quicker than grafted plants, and make larger and more shapely trees. I know of one large park in Oxfordshire, where this Oak has been freely used, planted in conjunction with the blue Cedar, *Cedrus atlantica glauca*. The trees are about 25 feet high, and, good as they are to-day, they are going to provide a magnificent feature in years to come.

It is difficult to imagine any Chestnut rivalling our common Horse Chestnut, but I believe that *Aesculus indica* does this. Its large panicles of white flowers are blotched with red and yellow, and they come about a month later than those of the common species. It was introduced from North-Western Himalaya some 80 years ago, where it attains about 100 feet. The largest tree in this country is, I believe, 75 or 80 feet high, and is of outstanding beauty. It has the additional merit that trees only 10 or 15 feet high will flower. It will grow well in most parts of England, but it is not a success in at least one cold upland garden in the South of Scotland, where it is regularly frosted.

While it will grow quite well in most positions, the deciduous Cypress of the Southern United States is happiest in moist ground. It is an admirable tree for planting beside a lake. The young foliage is pale green, and very light and feathery, and turns in the autumn to pale cinnamon-brown.

A genus of trees which is only just becoming generally noticed, is *Nothofagus*, the Southern Beeches, amongst which I would call your attention to two, both of which hail from Chile; *N. obliqua* makes a tree of 100 feet in its own country, and here must already be at

least 60 feet tall. It is deciduous and has oblong leaves about 2 inches long and half as wide, irregularly toothed, of a light bright green. The other, *N. Dombeyi*, is evergreen, or, in cold winters, partly deciduous. It was introduced from Chile by Mr. F. R. S. BALFOUR by seeds sent to Kew in 1916. A tree of the largest size in South America, it is doing very well here, and promises to make just as fine a tree as its deciduous cousin. Both these species are perfectly hardy, and they have an air of quality and grace which is hardly provided by any other tree known to me. I make no apology for leaving out of this paper any mention of our common trees, Oak, Ash, Beech, and others. This is through no disrespect for them, but only because there are so many newcomers which I think ought to be better known.

I will close these remarks by selecting twelve trees which to my taste are indispensable for a small park or garden. I have no doubt that everyone in this hall will disagree with me, and will put up a better selection, but at least mine will challenge comparison. They are: *Quercus coccinea*, *Liquidambar styraciflua*, *Aesculus indica*, *Nothofagus obliqua*, *Prunus Sargentii*, *Magnolia conspicua*, *Nyssa sylvatica*, *Sorbus Esserteauiana*, *Prunus Sekiyama*, *Malus Eleyi*, *Acer griseum* and *Eucryphia pinnatifolia*.

POPULAR WEED KILLERS.

By Dr. M. A. H. TINCKER, M.A.

[Read January 23, 1934 ; W. B. CRANFIELD, Esq., in the Chair.]

IN the introduction to his book on "Common Weeds of the Farm and Garden," LONG quotes a definition of agriculture as a "controversy with weeds." Gardeners also are unfortunately so closely acquainted with these plants that a full definition of weeds can happily be evaded ; the aphorism that a weed is a plant out of place serves our immediate purpose.

Weeds show great diversity in habit and structure, and vary from ephemerals and annuals to plants perennating by means of food stored in underground structures which frequently serve also as a means of vegetative reproduction. The seeds of the ephemerals and annuals may be capable of germination after prolonged periods of burial in the soil, as those of charlock are ; rhizomes and runners may spread far and last for a number of years. Such features intensify the struggle against weeds. The damage they cause may be conveniently tabulated thus :

(a) Damage caused to cultivated plants by the removal of water from the soil together with the soluble soil nutrients taken up by the roots of weeds. Such damage may be more serious in a dry season. The undisturbed competition between weed and cultivated plant may, not infrequently, result in the elimination of the latter.

(b) A further competition takes place between the sub-aerial parts of weeds and cultivated plants, referred to colloquially as a competition for sunshine. Certain twining plants may make this competition particularly keen.

(c) A third source of financial loss and annoyance to the grower is caused by the contamination of harvested seeds by weed seeds. The removal of the weed seeds may be a vital necessity.

(d) Certain weeds are poisonous to live stock, and their eradication brooks no delay by dairy farmer and stockbreeder.

(e) In a garden inestimable harm is done by the production of an appearance of untidiness.

Some idea of the damage may be gained from LONG's estimates : he considers 7s. 6d. an acre a moderate and conservative estimate in the case of grassland, and 20s. an acre has been suggested as a rough estimate of the cost of attempts to eradicate arable weeds. The methods of attempted eradication, or control, are very intimately related to the habit and character of the weeds, and the damage caused by them.

Cultivation Methods.

Premier place must be given to the various operations of cultivation as a means of controlling weeds ; if such are not generally considered *popular* weed killers, this is due to the expenditure involved, which includes money, time and much energy. The efficiency of these methods, if properly carried out, is beyond general question, and as they are well known brief reference will suffice : the cleaning of land whilst under root crops ; the effect of early cutting of hay ; the repeated cutting of bracken, of nettles, and of thistles before seed production ; and lastly, the use of hand hoes in the garden to remove young weeds. Yet all these methods are costly, so that more and more attention has been turned towards the chemical method of eradication, and more recently in certain countries towards biological control.

Chemical Weed Killers.

The perfect chemical weed killer should possess these attributes :

- (1) It should be thoroughly effective throughout the various seasons of the year and should be independent of climate and weather.
- (2) It should be easily handled by operators unskilled in dealing with chemicals ; it should be safe. A weed killer which is relatively non-poisonous to live stock, including birds, is preferable to a virulent poison, for it is exceedingly difficult to prevent small quantities of chemicals from entering the body either by the skin or mouth if operators are handling them all day. For use on arable land, a weed killer with a transient action on the soil is desirable ; for use on paths, a prolonged toxic action may be an advantage.
- (3) The chemical should be cheap, so that large areas may be treated economically.

It is proposed to examine various chemicals from all or some of these aspects and to see how far they fulfil these requirements. Proprietary articles as such will not be dealt with, but their active constituents will be considered.

Common Salt.

Salt has been used for long as a weed killer on paths. A strong solution prevents the osmotic uptake of water by the roots of adjacent plants. It is customary to employ a 10 per cent. solution made by dissolving 1 lb. in 1 gallon of water ; this is sufficient for 10 square yards. The salt may be scattered dry at an equivalent rate. Other salts used at equivalent concentrations would be approximately as effective. Heavy rain at once destroys the efficiency of such weed killers, which are dependent upon high concentrations and are not toxic at great dilutions. The after-effect left in the soil is for all practical purposes negligible unless repeated applications are used.

Although cheap and easily handled this substance fails to meet our general demands, as it is inefficient. Some success has, however, been achieved in checking yellow rattle, a parasitic weed of pastures, by dressings of 6 cwt. to the acre applied in late April or early May.

Petrol and Hydrocarbons.

Petrol is a mixture of the more volatile hydrocarbons readily obtainable. When applied to the rosettes of weeds in grass during winter the liquid rapidly enters the leaf and kills the tissues; a small quantity of surplus liquid will readily evaporate, so that the damage to the neighbouring grass is limited. Petrol has proved quite effective in killing rosettes of *Hypochaeris radicata* (cat's ear); it can be suitably applied as a fine jet such as that from a fountain pen filler, and each plant should receive about 5 c.c. (or $\frac{1}{8}$ fluid oz., or a teaspoonful approximately). This kills the central bud also if it is carefully applied. As the plant possesses a perennial rootstock, further application may be necessary if new buds are formed. Petrol has proved ineffective in eradicating dandelions, as new buds are formed from the deep rootstock; the rosettes of leaves are easily killed, however. On a grass path heavily infested with "cat's ear" one gallon of petrol was sufficient for 100 square yards (or 3.3 rods approximately). Heavy applications will injure grass. Less volatile hydrocarbons, as paraffin, also kill broad-leaved weeds, but they more readily injure the grass, leaving an area of yellow dead plants; these substances also have the further disadvantage that they remain longer in the surface layer of the soil. Both petrol and paraffin can be used only for "spot" treatments—that is, applied only to the weeds. In Jamaica diseased bananas have been killed by heavier oils poured on to cut surfaces of stems and suckers from the rhizomes. It is unlikely that these heavier hydrocarbons will be rapidly destroyed in the soil.

Ammonium Sulphate and Ferrous Sulphate.

The mixture of sulphates is recommended for weed eradication on established lawns, as a result of the experiments carried out for the Board of Greenkeeping Research.

Sulphate of ammonia	3 parts.
(Calcined) sulphate of iron (ferrous)	1 part.
Sand	20 parts.

These ingredients should be mixed with an equal weight of well-rotted leaf mould, or of good loam, and the final mixture applied at the rate of 8 oz. to the square yard. Four or five applications should be given at intervals of approximately a fortnight, commencing towards the end of February. The sulphate of ammonia provides a source of nitrogen for the grass and proves a tonic. The mixture causes a slight acidity in the soil which seems to favour the finer grasses particularly; quite possibly the ammonium (ion) part of the

mixture may act as a direct poison to the weeds only, which are eliminated chemically and biologically. In the writer's experience it has been found that the omission of the loam or leaf mould from the later dressings has not decreased the efficiency of the method: dressings of sand and chemicals have been effective. If this method is practised, it is highly desirable to give an autumnal dressing of leaf mould together with a light dressing of phosphatic and potassic fertilizers—basic slag must be avoided. On all soils the use of sulphate of iron should be discontinued when weeds have been eradicated; on sandy soils especially prolonged heavy dressings of iron sulphate may spoil the mechanical condition of the soil by causing "pan" formation—a layer of iron and sand almost impenetrable to water and roots. On chalky soils, which do not readily acquire an acid reaction, prolonged treatment is necessary. The dressings of leaf mould or loam, with the chemicals, are desirable so that a surface layer of relatively "chalk free" soil may be built up. The eradication of weeds from a lawn on chalk proves a more formidable task. In extreme cases it might be advisable to use the chlorate method to be mentioned later.

Persistent deep-rooted weeds such as dandelions (daisies too), can be eradicated by the "spot" treatment—by applying sulphates to the "crown" of the plant in dry weather. A strong mixture is recommended:

Sulphate of ammonia	.	.	35 parts.
Sulphate of iron (ferrous)	.	.	15 parts.
Sand	.	.	50 parts.

A "pinch" (some 4 or 5 grm., or about $\frac{1}{4}$ oz.) is applied. The chemicals slowly destroy the tissues of the weeds and penetrate downwards. A second application is generally advisable, and should be given ten days afterwards. Bare patches without grass will result: if these be too large to be re-colonized by the stimulated surrounding grass, re-sowing of grass seed—preferably in the late summer—will be necessary.

To facilitate the application of the sulphates various tools have been designed, from the containers of which an aliquot portion is delivered on to the weed by releasing a shutter; certain containers are designed to deliver an injection of poisonous solution into the rootstock and a small shower of dry chemicals to the crown.

Sulphate of ammonia costs approximately 8s. 6d. a cwt., with reduction for larger quantities; ferrous sulphate costs 17s. 6d. a cwt. Both chemicals are quite safe to handle if reasonable care be taken. Solutions may be used if desired, and in very dry weather it is advisable to water in the mixtures broadcast on lawns.

Carbolic Acid, Creosotes, Tar Products.

Inquiries as to the efficiency of various domestic disinfectants have been received at the Laboratory. The creosote and tar products

that are obtained as liquids are generally toxic to plants ; as weed killers their use is restricted, for in the soil their action remains for some time and many disinfectants, such as carbolic, destroy a large proportion of the soil population—an active flora and fauna. On paths they may be used with discretion, where they are not carried into the house, provided their odour is considered acceptable ! Generally proprietary mixtures do not reach the purchaser of small quantities sufficiently cheaply for garden use.

It is interesting to observe the temporary effect of the tar oil washes applied to fruit trees, upon the short weeds growing around the trees. The wash checks the growth and sometimes kills groundsel and similar weeds in foliage so early in the year ; it tends also to check various grasses growing as weeds in the fruit plantation. Frequently, however, the weeds recover : in about five or six months no effect is apparent.

Arsenical Compounds.

The toxic reaction of arsenical compounds is well known. Small quantities taken up by either plant or animal may prove fatal. As so small a quantity as 0.125 to 0.25 grm. (that is, less than $\frac{1}{160}$ th part of an oz.) may prove fatal, except perhaps to some Styrian addicts to the habit of arsenic-eating and to other workers in arsenic works, it is therefore obvious that the greatest care is required in handling arsenical sprays and solutions, and that such compounds do not meet all our requirements.

Arsenious oxide (As_2O_3), often known as white arsenic or merely termed arsenic, is a common starting point for the preparation of many compounds and mixtures. It is a heavy, gritty substance, dissolving sparingly in cold but more readily in hot water. Small quantities are often coloured black or bluish black by soot or indigo before sale.

Sodium arsenite is a more soluble compound and is the active ingredient in many arsenical weed killers. By mixing caustic soda and arsenious oxide in water a suitable stock paste may be made which may be regarded as a source of one of the acid sodium arsenites. Thus stir together

White arsenic	.	.	.	.	4 lb.
Caustic soda, flaked	.	.	.	.	1 lb.
Add water	.	.	.	.	2½ pints.

This will form a source of sodium arsenite suitable for weed killing, of approximately 80 per cent. arsenic composition (unsuitable for insecticidal purposes as a spray). Before using as a weed killer this should be diluted down to 1 in 100 by taking 1 lb. of the paste and stirring into 10 gallons of water. Quite a weak solution (0.5 per cent. of sodium arsenite) is efficient for killing weeds on paths. Stronger solutions may be made by diluting 1 lb. of the paste in 1 gallon of water, which gives approximately a 5 per cent. solution of arsenite.





FIG. 3 —THE ROCK GARDEN AT WISLEY FROM THE LONG POND

To face p 73.

Some proprietary weed killers are purchased as more concentrated solutions, and require dilution before use. Other sources of arsenites include certain sheep dips which have been used with considerable success as weed killers.

Similarly the pentoxide As_2O_5 , which is a very readily soluble compound, has also been used as a source of arsenic for weed killers. Solutions have proved of value against wild onion, and intimately mixed as an emulsion with glue and cresylic acid—to deter animals by its smell—some success has been obtained against the prickly pear. The glue is used to hold the arsenic against the flattened stems.

The salts obtained from this oxide have also been used as weed killers; perhaps the best known is sodium arsenate, which, when dissolved at the rate of 2 lb. to the gallon, makes a suitable mixture for killing old tree stumps by pouring it into drilled holes in the wood. This method has proved of value in killing ivy on walls and trees.

Schweinfurth Green and Paris Green, double salts containing acetates and arsenites, have a wide use as slug poisons; if dusted on to leaves they may cause scorching and damage. Arsenate of lead is a well-known insecticide.

The modern use of arsenic as a weed killer tends to be restricted to particularly troublesome weeds. WOODMAN* reported upon the efficiency of a 5 per cent. solution of sodium arsenate against wild onions; and in California CRAFTS† was able to control *Convolvulus arvensis* (lesser bindweed), *Centaurea repens* (a kind of knapweed) and *Sida hederacea* (mallow) by arsenical sprays. Having made up an arsenite paste (12 lb. white arsenic, 3 lb. caustic soda, and 1 gallon of water), he diluted this, using 1 lb. of paste to 12½ gallons, and then added 5 lb. (2½ pints) of strong sulphuric acid (or oil of vitriol). This spray was applied under pressure at the rate of 1 gallon to 10 square yards (which is quite a heavy spraying); experience showed that the afternoon and evening was the best time for this operation. The use of the sulphuric acid demands further care: it must be added to the diluted bulk, and acid-resisting spraying machines are a necessity.

Sulphuric acid alone can be used as a weed killer, and the theoretical interpretation of the virulence of this mixture is interesting.

The acid injures the leaves, killing the outer tissues; plants sprayed in the late afternoon readily take up the arsenical solution into their tissues, owing to the existing demand for water exhibited by these tissues after a period of active transpiration during the heat of the day. The arsenical compounds may reach the deep roots, passing downwards in the plant and slowly spreading from the vessels into the tissues. It will readily be appreciated that success is closely related to the physiological condition and water requirements of the plants; it might be limited by the presence of a high degree of saturation of soil and air.

* See Hort. Educ. Assoc. Year Book (1933).

† Hilgardia, vol. vii (1933).

The spraying materials might be expected to cost about 26s. an acre, at the heavy rate of application.

Chlorates.

Chlorates are exceedingly toxic to plants: sodium chlorate is particularly destructive. Calcium chlorate and sodium chlorate are two salts readily obtainable, and fairly soluble; the former exhibits a tendency to take up water vapour from the air or to deliquesce. An account of recent tests of the efficiency of sodium chlorate as a weed killer has appeared in the JOURNAL (vol. 59, p. 107), where a brief list of references to other tests will also be found. The following solutions have proved satisfactory:

To kill deep-rooted weeds, shrubs, rank	
grass, etc.	10 per cent. solution (dissolve 1 lb. in 1 gall.)
„ „ large weeds; grass in paths . . .	5 per cent. solution.
„ „ small weeds, annuals and on lawns	2½ per cent. solution.

Apply at the rate of 1 gallon to 10 square yards (in September) with an ordinary watering can with fine "rose" nozzle (care being taken to clean it after use), or by a small pressure sprayer either of the hand or knapsack pattern.

For such fine-leaved plants as gorse the spray proved ineffective without additional adherent substance. The chlorate may be applied as a fine dust by a rotary or other dusting machine, but it is essential that such be thoroughly clean before use, as the agitation of a dry mixture of chlorate and dust is likely to cause spontaneous combustion. Dry chlorate mixed with organic compounds such as sugars, paper dust, wood dust, chaff or straw and dust of cloth may readily ignite. Whilst a solution is quite safe, the risk of fire arising from dried clothing saturated with sodium chlorate must not be overlooked, as such material burns furiously. Calcium chlorate tends to take up moisture and this decreases the risk of fire. Magnesium chlorate has also been suggested as a weed killer. Mixtures containing chlorates can be purchased under various trade names: the relative efficiency depends on the percentage of chlorate present. The danger of poisoning from chlorates is a very small one if elementary precautions are observed: quite large quantities must be taken up to prove toxic; so that, provided stock do not graze heavily on recently sprayed pastures or plants, there is little likelihood of poisoning.

The relatively transient nature of these compounds in the soil permits of their use on open or cultivated ground; after early autumnal application of the weed killer it is safe to sow most garden crops in spring; certain seeds may be sown even earlier.

Grass is more resistant to chlorates, and it has been proved possible to kill ragwort (*Senecio* sp.), creeping thistles (*Cnicus arvensis*), bracken (*Pteris aquilina*), and nettle (both *Urtica dioica* and *U. urens*) in and

ROYAL HORTICULTURAL SOCIETY

ESTABLISHED 1804.

INCORPORATED 1809

NOTICE IS HEREBY GIVEN that the ONE HUNDRED AND THIRTY-FIRST ANNUAL MEETING of the Fellows of the Society will be held in the LECTURE ROOM, NEW HALL, GREYCOAT STREET, WESTMINSTER, on Tuesday, February 19, 1935, at 3 P.M. precisely, for the purpose of receiving the Report of the Council for the past year, and electing a President, Vice-Presidents, Treasurer, Three Members of Council, and Auditor for the ensuing year.

By Order of the Council.

F. R. DURHAM,

Secretary.

ROYAL HORTICULTURAL HALL,

VINCENT SQUARE, WESTMINSTER, S.W. 1.

January 30, 1935.

ANNUAL MEETING

To be held at 3 P.M., February 19, 1935

AGENDA

Minutes of the last Annual Meeting, held February 20, 1934.
Report of the Council.
President's Address.
Treasurer's Statement.
Election of President.
Election of Vice-Presidents.
Election of three Members of Council.
Election of Treasurer.
Election of Auditor.
Presentation of the Victoria Medals of Honour.
Presentation of the Associateships of Honour.
Presentation of the Lawrence Medal.
Presentation of the Holford Medal.
Presentation of the Veitch Memorial Medals.
Presentation of the Sander Medal.
Presentation of the George Moore Medal.
Presentation of the Williams Memorial Medals.
Presentation of the Cory Cup.
Presentation of the Loder Rhododendron Cup.

[P.T.O.]

LIST OF NOMINATIONS

The following list of President, Vice-Presidents, Members of the Council and Officers for election is circulated in accordance with By-law 58 :

<i>As President :</i>	<i>Proposed by</i>	<i>Seconded by</i>
LORD ABERCONWAY, C.B.E., V.M.H.	Lord Wakehurst.	Mr. C. T. Musgrave.

As Vice-Presidents :

THE DUKE OF BEDFORD, K.G., K.B.E., F.R.S.	} Lord Aberconway.	Mr. R. D. Trotter.
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By Order of the Council,

F. R. DURHAM,

Secretary.

January 1, 1935.

around pastures by the use of weak solutions of 1 or 2 per cent. without damaging the grass seriously. On lawns sodium chlorate has also given effective weed control—weeds such as ground ivy (*Glechoma hederacea*) have been eradicated in this way; re-sowing of the grass may be necessary. With care sodium chlorate has been used under small trees to kill nettles and gorse, and no damage has been caused to the trees. Below surface-rooting fruit trees it is essential to use a light spray to ensure that very little falls to the ground. Chlorates may be used on hard tennis courts made up of granite chips overlying ashes. It is advisable to wash the chlorates into the lower layers a few days after application in solution; this prevents accumulation in the surface layers. A slight tendency to cause the granite chips to dry slowly is also removed by the subsequent watering.

For killing weeds generally, the best season of the year proves to be the early autumn: the plants are treated when showing maximum leaf development.

Sodium chlorate may be purchased in metal containers, price 38s. 6d. per cwt. Chlorates cannot be sent by parcel post. Were it not for the danger of fire, sodium chlorate would meet all demands; the use of calcium chlorate diminishes this danger but does not entirely remove it.

Sulphuric Acid.

Sulphuric acid has a toxic action on plants and kills the leaves and other tissues when brought into contact with them, even at a dilution of 20 times its full strength.

Commercial brown oil of vitriol containing about 77 per cent. of pure acid may be obtained cheaply. Great care is required in handling concentrated acid: it must be poured gradually into a large volume of water (never must the water be poured into the acid); every precaution must be taken to avoid personal contact with the concentrated acid, which causes skin injuries and rapidly destroys clothing and wood, and dissolves many metals. The dilute acid is not nearly so dangerous, but is corrosive, so that acid-resisting sprayers must be used.

Up to the present time the chief use of sulphuric acid has been against annual weeds in cereal crops. The weak acid has been applied over fairly large areas (100 acres), either as a fine spray by pressure generated by the sprayers as they are moved over the fields, or as a mist created by a rotating fan revolving at a high velocity on to which the acid falls. Applied in May, the growth of young charlock has been so checked that substantial increases in the subsequent yield of grain were obtained. The narrow-leaved cereals escape permanent damage. Both yellow and white charlock have been successfully eliminated.

In America, France, and Norway particularly, a large number of careful experimental tests have been carried out. The following

abbreviated list shows some of the weeds killed and the concentration of acid employed :

	Per cent.		Per cent.
<i>Anthemis arvensis</i> (Camomile)	3.5	<i>Matricaria Chamomilla</i> (Camomile)	3.5
<i>Brassica alba</i> (white mustard)	3.5	<i>Papaver dubium</i> (poppy)	3.5
<i>Capsella Bursa-pastoris</i> (shepherd's purse)	3.5	<i>Polygonum aviculare</i> (knotgrass)	3.5
<i>Chenopodium album</i> (fat hen)	3.5-4.0	<i>Pteris aquilina</i> (bracken)	5.0
<i>Chrysanthemum segetum</i> (ox-eye)	3.5	<i>Ranunculus arvensis</i> (buttercup)	10.0
<i>Daucus Carota</i> (wild carrot)	10.0	<i>Senecio</i> sp. (groundsel)	3.5
<i>Euphorbia Peplis</i> (spurge)	4.0	<i>Sonchus oleraceus</i> (sowthistles)	3.5
<i>Fagopyrum esculentum</i> (buckwheat)	3.5	<i>Stellaria media</i> (chickweed)	3.5
<i>Galeopsis Tetrahit</i> (hemp-nettle)	3.5	<i>Urtica urens</i> (nettle)	3.5
<i>Lamium purpureum</i> (purple dead-nettle)	3.5	<i>Vicia</i> sp.	10.0
		<i>Galium Aparine</i> (cleavers)	3.5

Other species have been seriously injured and their growth checked by spraying with 10 per cent. sulphuric acid, including *Agrostemma Githago* (corn cockle), and *Scandix pecten-veneris* (shepherd's needle).

A few weeds have been found to be resistant to the acid, and this category includes :

<i>Allium rotundum</i> (onion)	<i>Allium vineale</i> (onion)
<i>Alopecurus agrestis</i> (foxtail grass)	<i>Avena fatua</i> (wild oats)
<i>Bromus mollis</i> (soft brome grass)	<i>Cnicus lanceolatus</i> (spear thistle)
<i>Lolium temulentum</i> (darnel)	<i>Matricaria inodora</i> (scentless may-weed)

Some of these plants have narrow leaves and others are grasses which resemble the cereals in habit.

The acid applied at the rate of about 80 to 100 gallons to the acre at concentrations of 8 to 10 per cent. has done no great damage to the soil, destroying only a small quantity of lime and not materially altering the soil reaction. Thus the acid does not leave any permanent deleterious effect on the soil. The cost, besides that due to depreciation of machinery, approximates to 10s. an acre under agricultural conditions.

For private and market garden use the action of the acid on vegetables must be considered. KORSMO,* after using a 4 per cent. solution, classified vegetables into the following groups :

- (1) Undamaged by the acid :
Cabbage, Cauliflower, Leek, Onion, Shallots.
- (2) Damaged, but recovered :
Pea, Lettuce, Swede, Salsify, Purslane, Dill, Thyme.
- (3) Damaged as severely as weeds :
Carrot, Radish, Beetroot, Celery, Parsnip, Broad Bean, Dwarf, Wax, and French Beans, Parsley.

It is seen that a few vegetables are quite resistant to the weak acid, and that this method of weed control is promising in the case of certain market garden crops ; the list of plants easily damaged prevents

* Meld. Norges Land., vol. xii (1932).

its economical use in small gardens where different vegetables are frequently grown in close proximity.

On grassland sulphuric acid has not been tried out very thoroughly, but indications have been obtained that it can check thistles and docks; against nettles it does not appear to have been very successful.

Copper Sulphate and Iron Sulphate.

"Bluestone" solution, or copper sulphate, has been used for a number of years to kill charlock (*Brassica Sinapis*) in cereals, the narrow leaves of the latter escaping serious injury. A concentration of 5 per cent. applied at a rate of 50 to 100 gallons to the acre has given fairly satisfactory results. Iron sulphate has proved effective at 15 per cent. concentrations and similar rates of application. Related weeds, such as *Raphanus Raphanistrum*, the so-called "white charlock," and smooth-leaved charlocks (possibly forms of *Brassica campestris*), have often proved to be more resistant to these chemicals. The success of this method is further limited by partial dependence upon the prevailing weather; rain falling soon after spraying greatly decreases the effect. Copper sulphate costs 32s. a cwt. Sulphuric acid promises to replace copper sulphate or iron sulphate as a weed killer for use in cereal crops.

Cyanamide.

Calcium cyanamide, in the form of a dust, has been used as a weed killer; the necessary rate of application is 4 oz. to the square yard. The dust adheres readily to leaves with short hairs; unfortunately it adheres to some vegetables and damages the foliage. This method of cyanamide dusting is also partially dependent upon the subsequent weather; heavy rain washes the cyanamide to the ground, where its fertilizing influence may soon be seen. The cyanamide treatment of soils before sowing possesses the advantage that only a very short interval (a month at the outside) of time need elapse before the grain is sown.

Ammonium Thiocyanate.

In recent years tests have been carried out in America and New Zealand* with a by-product from gasworks called "gas liquor." This contains ammonium thiocyanate or sulphocyanate. Concentrations of 2½ per cent. have proved effective in killing ragwort in pasture; the grasses were more resistant and recovered in a fairly short time. After its use on arable land wheat sowing shortly afterwards gave a satisfactory establishment of seedlings. At present the method is in the early experimental stages, but so far as the preliminary details can serve as a guide it may be said to be a very promising method. Details of costs and transport costs have yet to be worked out under our conditions.

* ASTON and BRUCE, N.Z. Journ. Agric., vol. xlvii (1933).

Biological Control.

Frequently it is possible to reduce the number of weeds by a "smother" crop, usually leguminous; vetches are used alone, or with oats, or a mixture of oats, beans and vetches, which produces a dense shading crop usually cut very early before seed production. Increased soil fertility may also accrue.

In other countries the introduction of plant parasites to attack the noxious weeds has resulted in effective control, as, for example, in the Hawaiian Islands, where the spread of *Lantana* was checked by the introduction of insects from Mexico, of which the most effective was a Tortricid moth, whose larvæ destroyed the flower stems and flower and fruit, so destroying potential seeds.

In Australia the co-operation of insects has been sought by those waging a campaign against the various species of prickly pear, *Opuntia*, which is spreading over vast areas at the truly alarming rate of a million acres a year. The introduction of the Cochineal insect rapidly accounted for 5,000 acres of *Opuntia*, but unfortunately this particular parasite proved fastidious, as it confined its attack to *Opuntia monacantha*. Nine years ago a Pyralid moth from the Argentine was successfully introduced, and the larvæ of this species, *Cactoblastes cactorum*, make a massed attack upon the stems and inner tissues of the prickly pears. Successive broods of the larvæ complete the task of despatching severely damaged plants.

In New Zealand similar entomological work is in progress by which it is hoped to control ragwort and blackberry. The blackberry, with many closely related and valuable plants, may prove a very difficult plant to deal with by these methods; for it will be obvious to all that the feeding habits of the parasite must be thoroughly tested before its release. In the possibility of a change in such habits a source of danger lies in these methods.

With mixed weed populations in small areas it appears rather unlikely that such methods will attain the same prominence.

In the author's opinion the chemical investigations in progress promise further advances in the near future towards the ideal weed killer; at the moment, despite the very serious drawbacks they possess—the danger of fire—the chlorates offer an efficient and relatively cheap method of weed eradication.

* * * * *

The following brief list of references may prove of use to Fellows desiring to read accounts of the experiments upon which the lecture has been based:

General:

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Arsenical Compounds :

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Chlorates :

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 W. L. LATSHAW and J. W. ZAHNLEY. *Journ. Amer. Soc. Agron.*, vol. xx,
 p. 1329 (1928).
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 M. A. H. TINCKER. *Journ. Roy. Hort. Soc.*, vol. lix (1934).

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 R. K. MACDOWALL. *Rep. Inst. Agric. Engin. Oxon.* (1933).
 E. RABATE. *Lib. Agric. de la Maison Rustique*, Paris (1927).

Ammonium Thiocyanate :

- B. C. ASTON and J. A. BRUCE. *N Z. Journ. Agric.*, vol. xlvi, pp. 109 ; vol.
 xlvii, p. 4.

Biological Control :

- A. D. IMMS. *Ann. App. Bio.*, vol. xiii, p. 402 (1926).
 ———. *Rep. Internat. Cong. Entomol.*, vol. ii, p. 4 (1928).
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HOW TO TREAT A LANDSCAPE GARDEN.

By ANNE, Lady BROCKET.

How not to treat such a garden may be a better way of expressing one's ideas, as so many beautiful natural gardens are spoilt by the kindly interference of man.

If you have a garden unspoilt by artificiality you are lucky, and can begin to eliminate, enlarge and beautify ; but be careful never to *make* a garden of this kind—keep your ingenuity for your formal garden, rock or bog garden, not for the garden of “Broad Stretches of Grass.”

“I never make a garden, I touch up Nature,” was a phrase I well remember the late Lady ABERCONWAY used when I was talking to her of making a garden. But even touching up Nature should only be attempted by those in touch with Nature. I have seen a fine circle of primeval Oak trees—a thousand years old, or more—almost obscured by thirty-year-old vigorous Plane trees of no beauty or value, although planted no doubt in the belief that they were adding to the beauty of the scenery.

When these were removed the fine Oaks, with the clear stretch of grass, stood out in their grand simplicity and beauty.

“WOOD” of Essex, so called in many eighteenth-century books, who mapped out many beautiful parks and gardens, never seemed to make a mistake, and one marvels how he planned and designed on so large a scale and yet could visualize the perfection of his work of the future. What would he feel if he could see the great Cedars and Spanish Chestnut trees now, which he planted as little trees of two or three feet high ?

Like so many others, he sowed and planted for others to reap the reward.

I will try to describe our garden, which WOOD made and left as an inheritance of beauty.

A garden of broad stretches of grass, a river widened into a lovely lake, undulating lawns sloping down three hundred feet or more from the house to the river, and to the right of the house in the distance, edging the river banks, the clear sharp green of the Deciduous Cypress trees (*Taxodium*), fifty-four of them in all, in their full summer beauty. Later on they will colour up as no other trees do to a lovely copper, and will shed feathery leaves to form a fairy-like path so beautiful that the gardener will be implored to leave it to the last minute before tidying up for the winter.

Eighteenth-century Cedars (some of the finest in England) give out the most delicious of all scents on a hot July day.

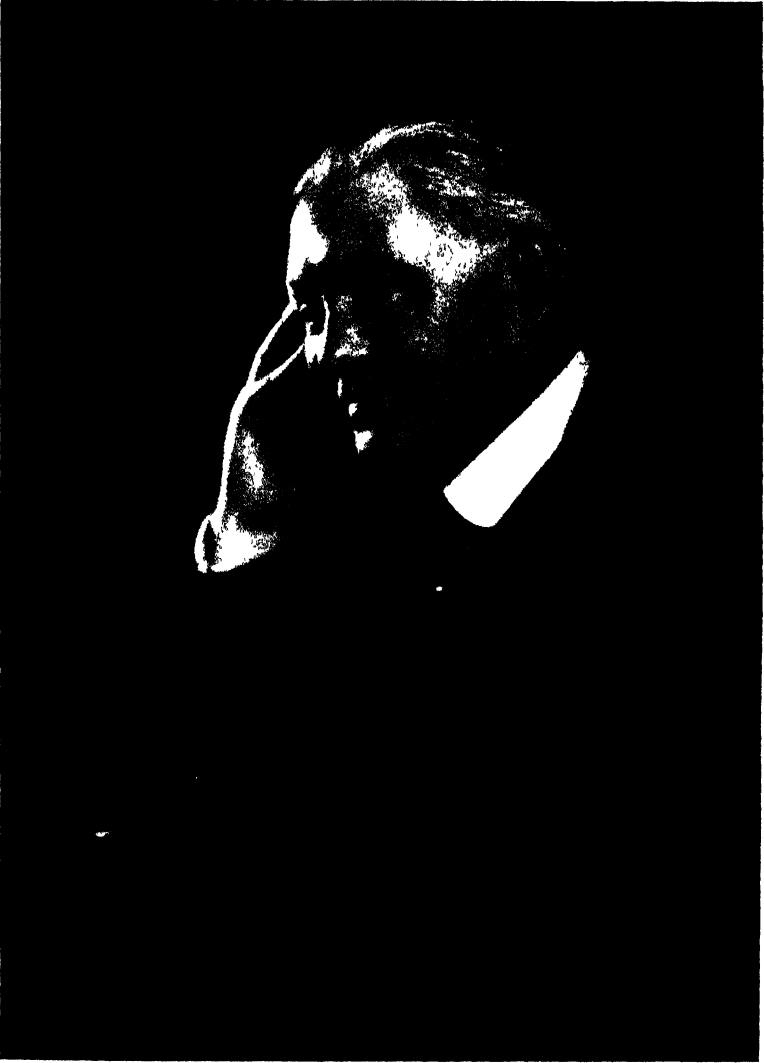


FIG. 4 —THE TAIL. SIR WILLIAM LAWRENCE, Bt., V.M.H.
Member of Council, 1922-28, 1933-34 Treasurer, 1923-28
(See p. 1)

(To face p. 80.)



FIG 5 —WILD GARDEN AT WISLEY FROM THE ROCK GARDEN BANK

[To face p. 81.

In the distance, to the left of the house, Beech trees are in their prime on the slopes running down to the river.

Such a garden needs no making, and indeed the greatest care is needed not to mar the picture in any artificial way ; a formal flower bed, even though of Iris or Spiraea, may make a false note.

A good plan is never to plant or alter unless you can revert to the original and are quite sure that your alteration is improving or beautifying the garden.

Six years ago, when I first came to this lovely spot, all the gardening one could think of was *eliminating*, doing away with large round and square beds of flowers in Nature's garden, doing away with the beds on the side of the river and replacing them with broad stretches of Iris and Primula—the Iris so lovely while I write, their blue and mauve flowers looking like delicate stained glass with the sharp light of the water behind them.

Then, again, we planted drifts of pure white Iris flowering earlier in the season, white because the swans frequent this part of the river, and white Iris and white swans seem to belong to each other.

I am writing in the summer-house high up above the river, and can see to the right and left and over the park across the river.

I can see large colonies of Pæonies in the distance, so large that they have become part of the landscape and cannot be called flower beds. Later on the brilliant red of the Phlox (' Doctor Königshofer ') will play Box and Cox with the Pæonies, making a rich note of colour in the late summer.

The Pæonies and Phlox are very happy together, both loving moisture and good feeding, and come in quick succession one to the other just when colour is needed.

In two places with backgrounds of Box trees we have planted many Japanese Cherries and Prunus ; they have made wonderful growth in three years, and this year they were lovely in the blossom time.

Azaleas on the banks were planted with trepidation and fear that they would find too much lime in the soil to suit them, but they seem quite happy even in this drought, though, I think, they were very grateful for a little Canary guano in the spring and again a good mulching of leaf mould after flowering.

We have Poppies, huge ones with black centres, in a mass round the Cedar trees, not scarlet, but deep red ; they are a fine contrast to the Cedar trees and must be increased next year.

For January, we have the Winter Aconite. We have covered a bank with it near to the house, and even in the snow I have seen its brave little cheery face telling us that winter is nearly over.

They naturalize easily *if left alone*, but woe betide if a gardener's rake is used before they have completely died down. They will probably completely disappear, and the five-minutes' work of the garden boy may do away with the five-years' growth and increase of this sturdy little winter friend.

After the Aconite comes the Crocus. Plant Crocuses in masses. We have them here on the slopes running down to the river—the yellow well away from the blue and white. What a lovely sight they are, poor brave little Crocuses with their many enemies: cock pheasants, who have flown in the winter to the garden for sanctuary, rats, field-mice, tits and robins—all of whom find them such delicious food.

But we will not lose hope, we will add and add and add to their numbers until they can all eat to their heart's content, and we shall still have Crocuses.

After the Crocuses come the Lent Lilies, pale but lovely, stretching as far as the eye can see under the Beech trees; then, almost before they are over, come Daffodils of other kinds—for half a mile or more early and late varieties of Daffodil *everywhere* with grass between—always have space of green grass between Daffodils, never a sea of them—space enhances their beauty and is more restful and true to nature.

Tulips in the grass too are lovely, and take the place of the earlier Daffodils. This year they were particularly fine (especially the 'Prince of Orange'), and evidently liked the heat of last summer which ripened their bulbs and seeds.

Then come the late white Narcissi carrying us well into the summer till the Irises and Primulas are in flower.

We have covered the end of the island in the river with Primula 'Wanda' and it is wonderfully effective in the distance, and a lovely contrast to the Daffodils with its rich purple colour.

Primula Florindae seems to be very happy here on the river banks and on the island and seems to be well established, and in another year or so will, I think, be a feature of the garden.

Then there is *Gentiana sino-ornata* which is making a thick carpet of green on the banks to the left of the house, soon to be a sea of blue, a joy and delight to everyone, in the early autumn.

They are strong little plants which even in these two hot summers of drought have doubled their numbers, and if they had only had rain would have increased fourfold.

And far away down the garden near the river we have blue Poppies—*Meconopsis betonicifolia*—doing well and promising to naturalize, which will be to see them in their real beauty.

Late Kniphofias, planted in beds eighty to one hundred feet long, are a lovely note of colour in the autumn when the trees are copper and gold. I have seen them in flower up to Christmas, and in my opinion there is no other flower to take their place in the autumn, with their lovely crimson-scarlet colouring.

If one has space to spare, Michaelmas Daisies in large scale beds can be beautiful. I once made such a garden and was fortunate enough to have a background of Fir trees and made the Michaelmas Daisy beds at irregular intervals with grass walks between them.

Make your beds long and large—never formal—with grass rides of

twenty or thirty feet between them. If you can spare the space for this garden, it should be about three hundred feet long.

Use no other flowers in these beds except perhaps bronze Helenium ('Moerheim Beauty') used sparingly, just to give a contrast and show up the mauve and blue of the Daisies.

Keep the taller varieties to the back of the beds and then the medium heights graduating down to the Amellus varieties in the foreground, always remembering to make sharp contrasts with the blues and pinks such as 'Blue Boy' and 'Little Pink Lady' or 'Nancy Ballard' and 'Blue Gem.'

How fortunate we are to have such lovely colours with which to "touch up Nature"—so different from those of twenty years ago when we had to wait patiently from the day the Dahlia turned black to the coming of the spring.

Now we have flowers all the year round, and should indeed be grateful.

AWARDS MADE TO PLANTS IN 1934.

Begonia 'Gloire de Lorraine,' 'Mrs. J. Petersen.' A.M. December 11, 1934. From Baron Bruno Schröder, Englefield Green. This variety of American origin has been in cultivation for many years. The bright rosy-cerise flowers measure $1\frac{1}{4}$ inch across and are borne on reddish stems. The dark bronze foliage is slightly tinted with red.

Billbergia vittata. A.M. December 11, 1934. From Messrs L. R. Russell, Richmond. A handsome semi-epiphytic plant from tropical America, requiring warm greenhouse treatment. The thick, spiny-toothed leaves are nearly 3 feet long, overlapping in their lower parts to form an erect cylinder of dark green, and attractively barred with silver. The upper part of the inflorescence is pendent and bears tubular, salmon-coloured flowers tipped with dark blue in the axils of long, rosy bracts.

Brassolaeliocattleya \times 'Nanette' var. 'Model.' A.M. November 27, 1934. From Messrs. Stuart Low, Jarvis Brook. (B.-l.-c. \times 'Everest' \times C \times 'Annette') A charming flower, large, pure white, except for a small rose spot on the centre of the fringed labellum.

Calanthe \times 'Brunton' var. 'Margaret Cookson.' F.C.C. November 27, 1934. From Clive Cookson, Esq., Nether Warden, Hexham. ('Hexham Lad' \times 'Ruby' var. *Cooksoniae*.) The large and well-formed flowers are white, and are apparently freely produced.

Calanthe \times 'Gerald' var. 'Darkie.' A.M. November 27, 1934. From Clive Cookson, Esq. ('Hexham Gem' \times *reveriensis*.) A pleasing hybrid with flowers of rich crimson, the labellum rosy crimson.

Cattleya \times 'Suavior' splendens. A.M. December 11, 1934. (*intermedia* \times *Mendelii*.) From Messrs Charlesworth, Haywards Heath. Attractive petals heavily flushed with dark purple on the apical portion.

Chrysanthemum 'Apricot Favourite.' A.M. December 11, 1934. From Mr. J. A. Macleay, Ayr. A light buff decorative variety tinged with apricot and having the outer florets heavily suffused with pink. A sport from 'Deep Pink Favourite.'

Chrysanthemum 'Avondale Sunset.' A.M. November 27, 1934. From Messrs. Tyson, Crawley. A large single variety with several rows of broad, light, reddish-bronze florets tipped with yellow. The flowers are 5 inches in diameter.

Chrysanthemum 'Biterre.' A.M. November 6, 1934. From Messrs. Luxford, Sawbridgeworth. A large, bright chestnut-red exhibition Japanese variety, having broad drooping curled florets with an old gold reverse.

Chrysanthemum 'Bridgwater Beauty.' A.M. November 6, 1934. From Mr. J. A. Barrell, Bridgwater. A light bronze, medium-sized Decorative variety suffused with pink and having a light yellow reverse.



FIG. 6.—*MECONOPSIS REGIA* AT WISLEY

[To face p. 84.



FIG 7 - CYANANTHUS INTEGR AT WISLEY
(A.M. 1034 See vol 59, pp 453, 484)



FIG 8 — BERBERIS LYCIOIDES



FIG. 9. CLEMATIS INDIVISA LOBATA, STEAD'S VAR.

To face p. 85

Chrysanthemum 'Bronzelight.' A.M. November 6, 1934. From Mr. J. A. Barrell. A very distinct and free-growing Decorative variety of medium size. The light fiery-red florets are twisted and sharply pointed and have an old gold reverse.

Chrysanthemum 'Florence Woodward.' A.M. November 6, 1934. From Messrs. Luxford. A large, light Primrose-yellow exhibition Japanese variety, with long curled florets. A sport from 'Mrs. Alex. Aikman.'

Chrysanthemum 'Hilldene.' A.M. November 27, 1934. From Mrs. M. Emery, Flitwick. A bright yellow incurved variety of good form.

Chrysanthemum 'Jane Ingamells.' A.M. December 11, 1934. From Mr. T. Stevenson, Hillingdon. A very pale sulphur-yellow incurved variety of excellent form.

Chrysanthemum 'Madelon.' A.M. November 6, 1934. From Messrs. Luxford. A large, light bronze exhibition Japanese variety, with broad florets having a pale yellow reverse.

Chrysanthemum 'Nellie Ross.' A.M. December 11, 1934. From Mr. T. Stevenson. A large decorative variety with broad incurving citron florets.

Chrysanthemum 'Oak Leaf.' A.M. December 11, 1934. From Mr. T. Stevenson. A large, flattish decorative variety with incurving broad florets which are buff on the outer side and old rose on the inner.

Chrysanthemum 'Pose.' A.M. November 6, 1934. From Mr. J. A. Barrell. A large Decorative variety of excellent form with broad bright Buttercup-yellow florets.

Chrysanthemum 'Printemps d'Amour.' A.M. November 27, 1934. From Mr. T. Stevenson, Hillingdon. A large silvery-pink Decorative variety with incurving narrow florets. It is of French origin.

Clerodendron splendens. A.M. November 6, 1934. From Messrs. L. R. Russell, Richmond. An ornamental greenhouse shrub with broadly ovate, cordate, bright green leaves and flattish panicles of tubular, scarlet flowers.

Cotoneaster 'St. Monica.' A.M. November 27, 1934. From L. de Rothschild, Esq., Exbury. A very vigorous and handsome variety with lustrous, dark brown shoots bearing elliptical, rich green leaves up to 6 inches in length. The globose-obovate, shining crimson berries are borne in heavy, drooping clusters 4 inches across on short lateral twigs.

Cypripedium × 'Camelot.' A.M. December 11, 1934. ('Phantasy' × 'Walter Moore.') From L. de Rothschild, Esq., Exbury. A distinct flower; dorsal sepal white with a greenish base; petals and labellum light green.

Cypripedium × 'Welcome' var. 'Alpha.' A.M. November 27, 1934. From Messrs. Sanders, St. Albans. ('Juliet' × 'Gwen Hannen.') A bold flower in which the round dorsal sepal is heavily marked with dark crimson spots.

Gentiana rigescens. A.M. November 6, 1934. From Lionel de Rothschild, Esq., Exbury. This species shows considerable variation in habit and flower-colour. The plant which received the Preliminary Commendation three years ago was erect and bore light violet flowers. The present plant is of procumbent habit. The pale green, oblanceolate leaves are 3 inches long, and the small, pale blue flowers are freely produced in terminal and axillary clusters.

Geranium Donianum. A.M. June 12, 1934. From T. Hay, Esq., Hyde Park, London. A pretty, perennial species from Nepal. The plant is almost stemless, forming a cluster of five-parted, finely-lobed hairy leaves. The low-branching scapes bear many rounded flowers of rosy-purple.

Idesia polycarpa. A.M. November 6, 1934. From Lord Wakehurst, Ardingly. A striking, deciduous, Japanese tree with large, heart-shaped, remotely-toothed leaves. The small, greenish, unisexual flowers are inconspicuous, but they are followed by highly ornamental brick-red berries in long, pendent, grape-like bunches.

Lilium Grayi. A.M. July 10, 1934. From Viscountess St. Cyres, Lymington, and Major F. C. Stern, Goring-by-Sea. The specimens exhibited were tall and slender, bearing whorls of ovate-lanceolate, acuminate leaves and several semi-pendent flowers. In this form, which is commonly grown as *Lilium Grayi*, the perianth is bell-shaped; the segments are acutely pointed and widely spreading, as in *L. canadense*, crimson externally and orange, spotted with purple, within. *L. Grayi*, as depicted in the Botanical Magazine, t. 7234, has a flower of different shape, the perianth segments narrowing more abruptly to a point and showing no tendency to spread or reflex. The colour is a more uniform deep red, spotted within, and also externally on the edges of the segments, with purple.

Lycaste fimbriata. A.M. November 6, 1934. From Messrs. Sanders, St. Albans. The plant bore five large flowers with sepals and smaller petals of pale ivory-green colour, the labellum greenish yellow.

Odontoglossum × '**Melindrum**,' **Prinsep's var.** A.M. December 11, 1934. (*crispum* × '*Rêve d'or*.) From N. Prinsep, Esq., The Boxes, Pevensey, Sussex. The well-formed white flowers are marked with citron-yellow spots and blotches.

Pentapterygium rugosum. A.M. November 27, 1934. From Miss G. Waterer, Ludgvan, Long Rock, Cornwall. An attractive small shrub from the temperate regions of the Khasia Mountains, where it is often epiphytic on the trunks of tall trees. The leaves are elliptical-lanceolate, coriaceous and rugose, dark green above and paler beneath. The flowers are arranged in pendent axillary clusters of 4 to 6. The corolla is 1 inch long, tubular and prominently angled, in colour ivory-white flushed with rose and transversely barred with purple lines.

Phyllitis Scolopendrium crispum splendens. A.M. November 6, 1934. From Mr. W. B. Cranfield, Enfield. A good variety of the Hart's-Tongue fern, with ample spreading fronds 18 inches long and 4 inches wide; their finely-toothed edges deeply and evenly frilled.

Pyracantha Rogersiana aurantiaca. F.C.C. November 6, 1934. From Lionel de Rothschild, Esq., Exbury. A choice shrub of open, branching habit. In the spring the twigs are covered by innumerable small, creamy-white flowers, which give place to globose orange-red berries. This variety received the A.M. in 1919, when the equally valuable yellow-fruited variety *flava* was given the F.C.C.

Sambucus coerulea. A.M. October 9, 1934. From Viscountess Byng of Vimy, Thorpe-le-Soken. A striking North American shrub or small tree. The leaves have 11 or 13 large, elliptical serrulate leaflets. The slaty-black berries are covered with a heavy bloom and are borne in dense, drooping corymbs.

Sophrolaelocattleya × 'Nanette,' 'Excelsa.' F.C.C. December 11, 1934. (S.-l.-c. × 'Meuse' × C. × 'Dinah.') From Messrs. McBean, Cooksbridge. Flowers rich magenta-purple, the apex of each petal and the front lobe of the labellum dark ruby-crimson.

Sorbus Conradinae flava. A.M. October 9, 1934. From Messrs. R. Wallace, Tunbridge Wells. A handsome shrub or small tree of erect growth. The large leaves have 13 to 15 evenly toothed, elliptical leaflets, covered on their under sides with a dense grey tomentum. The small, yellow berries are carried in dense clusters as much as 6 inches across.

Viburnum foetidum. A.M. October 23, 1934. From Lionel de Rothschild, Esq., Exbury. A half-evergreen shrub of erect and dense habit. The leaves are bright green, ovate or elliptic, sparingly and coarsely toothed. The small, ovoid fruits are bright crimson, and are carried in very dense terminal and lateral clusters. Collected by Forrest in Western China, and shown under his number, 27,410.

AWARDS MADE TO FRUITS IN 1934.

Blackberry 'John Innes.' A.M. September 19, 1934. From Messrs. Laxton, Bedford. This variety was raised by Mr. M. B. Crane at the John Innes Horticultural Institution, Merton, in 1923 by crossing *Rubus rusticanus inermis* and *R. thyrsiger*. It is a very heavy cropping variety of moderate vigour. The berries are large, deep black, round to bluntly conical, and well-flavoured. The crop begins to ripen at the end of August and the season extends well into October. As a late ripening variety this is regarded as a valuable acquisition for the garden and commercial plantation. The plants growing on the Fruit Trial Grounds at Wisley have cropped remarkably heavily over several years.

Plum 'Laxton's Delicious.' A.M. September 19, 1934. From Messrs. Laxton, Bedford. This excellent dessert variety was raised by Messrs. Laxton by crossing Coe's Golden Drop with Pond's Seedling. The fruit ripens about mid-September, is medium to large, long, oval and tapering to the stem, coloured deep crimson and mottled with scattered amber spots on the skin. The flesh is yellow, very sweet and richly flavoured. The trees in the Fruit Trial Grounds are of good vigour, upright in growth, and have carried good crops in 1933 and 1934. A detailed description of this variety will be published after further observations upon trees undergoing trial at Wisley.



FIG. 10.—MONUMENT TO DAVID DOUGLAS, ERECTED IN HAWAII BY HILLO BURNS CLUB, 1934

[To face p. 88.

THE AWARD OF GARDEN MERIT.—XXVIII*

By F. J. CHITTENDEN, F.L.S., V.M.H.

187. DABOECIA POLIFOLIA.

Award of Garden Merit, April 7, 1930.

St. Dabeoc's Heath, *Daboecia polifolia*, is a native of Connemara and S.W. Europe, and like nearly all its near relatives, the species of *Erica* and *Calluna*, it likes a light soil free from lime. Peat is not necessary: its place may be taken by leaf mould, and all who have a sandy soil may grow this if they will mix with the sand some good leaf mould. And it is worth growing for its dark green heath-like foliage, its neat habit if the old flower spikes are clipped off in early spring, and its beautiful bell-shaped flowers, $\frac{1}{4}$ inch in length, hanging on the racemes which terminate most of the numerous branches from late June till frosts come.

One does not see the full beauty of this plant unless it is planted in a mass, and it must be in sun to show itself to advantage. There is considerable variation in the colour of the flowers, and if seedlings are raised, as with care may easily be done in a sandy peat compost, the best form may be picked out and propagated by cuttings of the young growths taken in August and rooted in the same type of soil in a close frame.

The racemes of flowers may ultimately reach 5 inches in length and place the rosy-purple flowers well above the foliage. There is a good white form with somewhat paler foliage useful for growing here and there among the purple, and a curious ever-sporting form with flowers sometimes purple, sometimes white, sometimes variegated purple and white.

The bushes reach about eighteen inches in height eventually, but in very severe weather they may be cut to the ground, to spring up again however with the coming of warm weather and to flower quite freely in summer. The plant is sometimes referred to as *Menziesia polifolia*.

188. CLEMATIS MONTANA.

Award of Garden Merit, July 28, 1930.

Just over a hundred years ago, in 1831, Lady AMHERST introduced to England from the Himalaya a plant which has proved one of the loveliest in our gardens. It was the vigorous hardy climber, *Clematis*

* The notes on the first hundred plants to receive the Award of Garden Merit have been collected from our JOURNAL, vols. 47 to 53, and published as a pamphlet, price 1s. For subsequent notes see vol. 54, pp. 218 and 423; 55, pp. 121 and 276; 56, pp. 80 and 245; 57, pp. 65 and 354; 58, pp. 171 and 400; and 59, pp. 131, 308, 360, 406, and 449.

montana. It will grow to 20 feet in height in a very short time in any ordinary soil and trained on a wall or allowed to scramble over bushes or an old tree, and in May will produce its white flowers, each about 2 inches across, in clusters of three or four at every node. As with all the early flowering species of *Clematis* such pruning as is necessary (that is, sufficient to keep the plant to the space it is to occupy) must be done soon after the flowers are past ; it must never be delayed until winter. *C. montana* looks nowhere better than when growing over shrubs or small trees, though one must of course choose such as are not too rampant in growth, or such as are especially choice. A small dead tree makes an excellent scaffold for it

Of recent years two or three new forms have been introduced from China. The very pretty variety *rubens* with flowers of soft pink or even as deep as rosy-red has a purplish tinge, especially on the petioles and young stems and to some extent on the leaves. The variety *Wilsonii* has white flowers about 3 inches in diameter on downy stalks (the type has smooth stalks to the flowers). The variety *rubens* flowers rather later than the type, and *Wilsonii* later still, even in July. *C. Spooneri* is also sometimes regarded as a variety of *C. montana* (*C. montana sericea*). It too has white flowers but with the outside of the sepals downy with yellowish hairs ; the flowers are 3 inches in diameter and the stalks hairy, like the stems.

These were all introduced by Mr. E. H. WILSON, the first two from Central, the third from West, China.

GARDEN NOTES.

Clematis indivisa lobata.—This *Clematis* is reputed to be tender, and it was therefore planted at Bodnant at the foot of a south-west wall, which had a glass fruit shelter above it in the winter. It made strong growth and has been trained along the wall past the shelter of the glass. It has grown for several years in this position. It flowers with remarkable freedom—the whole plant being covered with large white blooms with conspicuous anthers.

This species has a male and female form, the male as a rule having larger flowers.

Mr. STEAD, the well-known New Zealand gardener, collected seed from an especially good form, and a plant grown on at Bodnant from this seed received an F.C.C. this spring (see vol. 59, p. 402, and fig. 9). It was grown under a glass shelter like the older plant. Another of the same batch, however, with even finer flowers than the F.C.C. form, grows in the open on a north-west wall.

In beauty, this *Clematis* surpasses even the best forms of *C. Armandii*, although, of course, the latter is the hardier of the two and would succeed in colder climates.—*Aberconway*.

Anacrinum × *Howardii*.—This hybrid between *Amaryllis Belladonna* and *Crinum Moorei*, raised by Mr. FRED HOWARD of Los Angeles, is proving itself a first-class garden plant.

The evergreen foliage, like that of all *Crinums*, gets cut down by the frost in winter, but the bulb is not injured, and a fine display of leaves is made during the summer.

In the latter half of September the flower spikes are thrown up. The individual blooms are pale pink with a yellow centre, and there are twelve to twenty or so to a head, opening one after the other. They have a most delicious fragrance.

This plant has an excellent constitution and seems to flower just as well in a bed away from a wall as when planted at the foot of a wall.—*Aberconway*.

Natural Regeneration of Camellia japonica at Wisley.—As is well known the varieties of *Camellia japonica* succeed well at Wisley in half shade in the Wild Garden, and during the last two years the plants flowered exceptionally well, and capsules containing good seed were produced.

A short time ago it was brought to my notice that seedlings were growing, principally near a semi-double red-flowered variety planted in a large bed of various varieties. The seedlings, which are now about four inches high and bear about four leaves, are probably two years old and have a vigorous appearance.

which are indicated by an encircling reef, closely investing the south shore, but separated on the north by six to eleven miles width of sea, full of rocks and shoals. Navigation is possible only by a narrow channel and during daylight. Deep abysses of ocean separate the islands from any other land-surface; there is no question of previous connexion with the American continent or the West Indies, and the original fauna and flora must have arrived by transport by wind, ocean currents or the agency of birds.

On the hillsides the soil is thin, but in the valleys there is a good depth of fairly rich reddish loam. The freshwater marshes have a deep black or brownish soil, and on parts of the coast there are salt marshes and Mangrove swamps. There are no streams or springs and water supply depends on the rainfall, about fifty-eight inches, fairly generally distributed through the year; the summer months are the wettest. Every house-roof is a catchment area and the water is stored in tanks. Persistent rain is rare. There are heavy showers, but the ground dries very quickly afterwards in the warm sunshine.

Since the settlement of the Bermudas by the British, early in the seventeenth century (the islands were previously uninhabited), the original vegetation has been much altered as the result of cultivation and the introduction of alien immigrants. In some cases it is impossible to decide whether a species has reached the islands naturally or otherwise, and some of the naturalized species would be taken for natives were it not for records of their introduction. Dr. N. L. BRITTON in his "Flora of Bermuda," records as native 165 flowering plants and Ferns, 15 of which are endemic (that is, confined to the islands), and about 300 completely or partially naturalized. He also includes 864 species of cultivated plants, either now growing or recorded as having been grown there.

The characteristic tree is the endemic 'Cedar,' *Juniperus bermudiana*, which clothes the hills and extends to the rocky coasts where remarkable wind-blown specimens may be seen maintaining a precarious existence on practically bare rock. When growing freely it is a shapely tree, its grey-green foliage contrasting well with the stringy bark, and fine specimens, 70 feet in height, may be seen in the park-like grounds of private estates or in the valleys where there has not been clearance for cultivation (fig. 11). Production of early crops mainly for American markets is the one industry of Bermuda, apart from the tourist traffic. Strawberries, Potatos, Tomatos, Carrots, Celery and other crops are extensively grown and an efficient grading and packing service has been established by the Department of Agriculture, which also conducts useful experimental and supervisory work. The most spectacular crop is the Easter Lily (*Lilium longiflorum* var. *eximium*), the fields of which are a beautiful sight towards the end of March (fig. 12). Thousands of the unopened flowers are packed and sent to New York for the Easter festival; bulbs are also extensively exported. The virus diseases, which threatened the destruction of the

fully described in our Society's publications. Prompt destruction of diseased plants, following periodical inspection of the Lily fields by the Department of Agriculture during the growing season, now keeps the diseases in check. In the hope of extending the industry other species of *Lilium* are being tried; and also the hybridization of the var. *eximium* with other varieties of *longiflorum*, the latter especially with the aim to raise a variety which would be slightly hardier and have a sturdier texture of flower. Experiments on cold storage of the bulbs are also being carried out.

Sixty years ago Oranges, Lemons, Peaches and other fruits were grown in abundance, but the introduction of scale and fruit-fly put an end to their cultivation. Bitter Orange and Lemon have become naturalized and yield good crops in the winter under the shade of the Junipers on the hillsides. Citrus cultivation, by private individuals, is now being revived, in response to the efforts of the Department of Agriculture.

The endemic Palmetto, *Sabal Blackburnianum*, is after the 'Cedar' the most conspicuous native tree. It is a small but rather handsome fan-leaved palm with a stout cylindric stem and bearing spikes of black drupes, $\frac{1}{2}$ to $\frac{3}{4}$ inch long. The hard seeds, when ground to powder, supplied the first settlers on the island with flour. Unfortunately the Palmetto is threatened with destruction by a scale-insect which attacks the leaves, but this subject is also under experimental investigation.

To the botanist the Bermudas afford an interesting study in the replacement of native species by alien immigrants. Indiscriminate felling of the Juniper is now forbidden, but in the neighbourhood of the capital, Hamilton, it is being attacked by the Fiddle-wood, *Citharexylum spinosum* (a misnomer as it bears no spines), a West Indian species which was introduced about 1840. A large tree in Paynter's Vale is pointed out as the original introduction. It is of rapid growth but useful only as a shade tree and for firewood, as the wood is very brittle. The leaves turn red before falling in late winter and form an agreeable contrast with the grey-green Juniper. But its seedlings grow rapidly in the shelter of the Junipers, and kill out the lower branches of their protector, defacing and ultimately destroying it. Fortunately, owing to its brittleness, it suffers severely in the strong winds which the Juniper has learned to withstand. Another naturalized introduction, the Allspice or Pimento (*Pimenta officinalis*), is threatening the Junipers on the hillsides in Warwick parish, though it must be admitted that its fresh green foliage provides a pleasing contrast.

The commonest shrub is a Sage-bush (*Lantana involucrata*), native of Florida and the West Indies. Governor LEFROY, the first serious student of the flora of the Islands (he published a list of about 780 species in 1884) states that it was introduced prior to 1800 with the idea that it would be good for firing, for which, however, it is useless, as it makes practically no wood. It has, however, every appearance

of a native. If an introduction, it has certainly largely supplanted natural undergrowth. It is an uninteresting plant with small heads of pale lilac or whitish flowers, and is easily uprooted. A more decorative and undoubted introduction is another American species, *L. Camara*, which has become a pest in many parts of the tropics. It frequents more open situations. The flowers vary in colour from yellow to deep orange on the same head. A still more decorative species is *L. aculeata*, first observed in 1905 in Devonshire parish near the south shore, where it is still fairly plentiful. It is well protected by stout hooked prickles. A native of tropical America, it may be a garden escape in Bermuda.

A pernicious interloper is a species of Jasmine (*Jasminum simplicifolium*), native of Australasia and introduced about 1840, which has overrun the neck of land between Harrington Sound and Castle Harbour. This tract, a rocky hill ridge with deep pockets of soil and damp caves, separating the two large pieces of water, was until recently one of the few undisturbed portions of the islands and the last resort of some of the endemic and native species. Development in the form of a quarry established by the Public Works Department and a huge luxury hotel, has destroyed most of it, while the remainder is overrun by the Jasmine, the long, tough closely clinging stems of which carpet the undergrowth and throttle the trees. It threatens with extinction the only other endemic tree, *Elaeodendron Laneanum* (Celastraceae), a shapely evergreen with polished dark-green leaves, once common on these rocky hillsides, but of which only an occasional specimen can now be seen.

An endemic shrub, the Bermuda Snowberry, *Chiococca bermudiana* (Rubiaceae), a pretty plant, 2 to 6 feet high, with glossy lightish-green leaves, racemes of pale yellow bell-shaped flowers, and snow-white berries, is still fairly frequent on hillsides. Three other endemics still hold their own and are conspicuous features of the flora: the national flower, the Bermudiana (*Sisyrinchium Bermudiana*), with starry bright violet-blue flowers, appears everywhere in sunny places in the spring; albinos are occasionally found; *Erigeron Darellianus*, a small shrubby perennial with profuse white daisy-like flowers, abundant on rocky situations, often decorating roadside rock walls; and a dainty Maidenhair Fern (*Adiantum bellum*), common on shaded rocks and walls. Another endemic herb, *Peperomia septentrionalis*, formerly abundant on shaded rocks in the despoiled area at Harrington Sound, still lingers there, and may also be found in Paget Marsh.

The few remaining marshes, especially in Devonshire and Paget parishes, supply the best representation of the original flora. One has to walk warily to avoid sinking in the rich black mud which supports a luxuriant growth of tall Ferns, *Osmunda regalis*, *O. cinnamomea* with beautiful spikes of cinnamon-coloured sporangia, the Giant Fern (*Acrostichum excelsum*) with leathery leaves 2 to 4 feet long, and a bracken (*Pteris caudata*) with sprawling leaves 6 feet long. Two species of Shield Fern (*Dryopteris normalis* and *D. Thelypteris*)



FIG. 11 —OLD JUNIPER TREES BY DEVONSHIRE CHURCH.

[To face p. 96.]

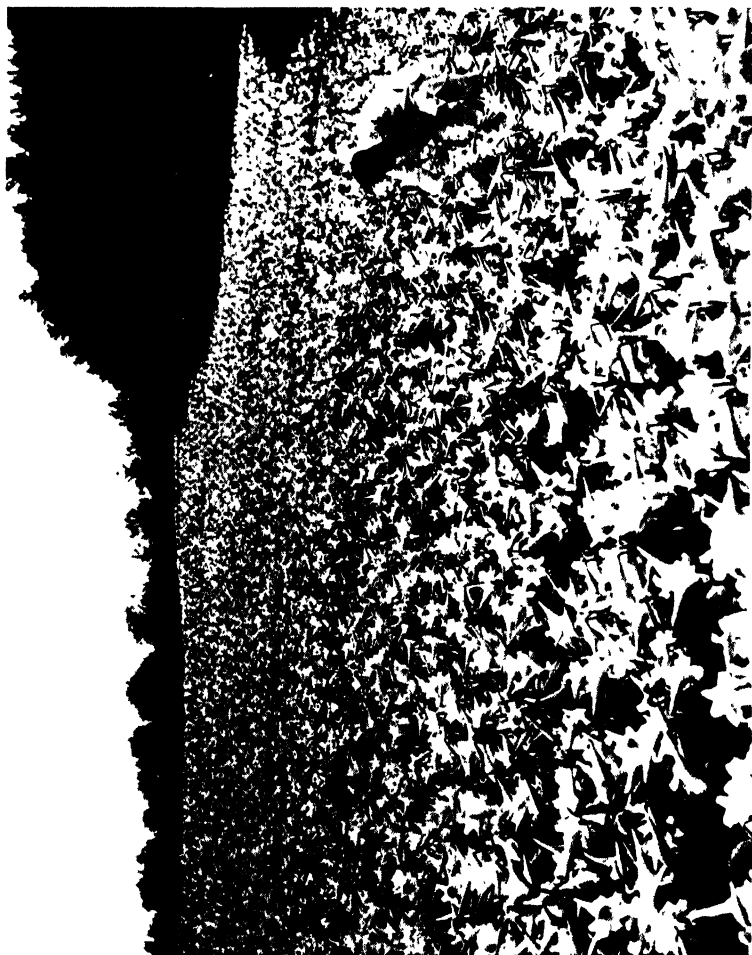


FIG. 12. *LILIU LONGIFLORUM LINNIUM* IN BERMUDA.



FIG 13 --VIEW FROM WRECK HILL, NEAR ELY'S HARBOUR, SOUTH SHORE
Low-growing Junipers extend to the edge of the low cliff



FIG. 14 -AVENUE OF ROYAL PALM (*Oreodoxa regia*).

form graceful clumps. The Wax Myrtle (*Myrica cerifera*) and a Composite, the Dog-bush (*Baccharis glomeruliflora*) are tall dense bushes, and on drier spots rise the stout columns of the Palmetto. A few clumps of the endemic *Carex* (*C. bermudiana*) were found and other damp-loving herbs and shrubs contribute to the undergrowth. On the damp floor, on the bases of the Palmettos and the stocks of the Ferns, are Mosses and Liverworts, over fifty species of which are recorded from the islands.

The shore, especially on the south, which is a succession of cliffs, rocky bays with beaches of smooth white or pinky-white sand (fig. 13), and stretches of sand-dunes, has a characteristic flora. The Sea-Grape (*Coccoloba uvifera*) may grow to a small tree, its roundish leathery leaves, often six inches across, turn red before falling, and the astringent fruit resembles bunches of small purple grapes. On the coastal rocks are great clumps of Sea Ox-Eye (*Borrchia arborescens*), with silky-grey or smooth green foliage, often on the same plant, and deep-yellow flowers. Another shrub, the Beach Lobelia, *Scaevola Plumieri* (Goodeniaceae) with fleshy spoon-shaped leaves, forms straggling masses on the beaches or dunes. Other characteristic shrubs are the so-called Sea-Lavender (*Tournefortia gnaphalodes*), allied to the Heliotrope, with dense silky foliage; *Suriana maritima*, with tassel-like clusters of softly pubescent leaves, a widely spread coastal plant, the earliest reference to which (in Plukenet's 'Almagestum,' p. 44, t. 241, 1696) is a Bermuda specimen, and the Spanish Bayonet (*Yucca aloifolia*). A small Cactus (*Opuntia Dillenii*) is also common. Two efficient sand-binders are a species of Bean, *Canavalia obtusifolia*, and *Ipomoea Pes-caprae*, the slender rope-like stems of which creep long distances through the sand. These are all undoubtedly native.

One of the most decorative native plants is a purple Morning Glory (*Ipomoea cathartica*), which climbs over the undergrowth in thickets and by roadsides. It forms a beautiful combination with the pink flowers of the Oleander, introduced in 1790, and now the universal hedge-plant in the islands, blooming freely throughout the spring and summer. Other prominent and thoroughly naturalized introductions are Tamarisk, which has been extensively planted as a screen along the north coast road, the Wild Sisal (*Furcraea macrophylla*), native of the Bahamas, abundant in thickets and woodlands, the tall flowering poles of which reach 30 feet in height; Surinam Cherry (*Eugenia uniflora*), common in thickets and on hillsides, the bright-red cherry-like fruits of which are edible; and a Holly (*Ilex vomitoria*) used for decoration. Among naturalized herbs are two Buttercups from Europe (*Ranunculus parviflorus* and *R. muricatus*). The Bermuda 'Buttercup' is *Oxalis cernua*, a garden escape, which is common on waste ground; *O. corniculata* is also abundant in similar localities, as is also a Crane's-bill (*Geranium carolinianum*), a native of Eastern North America, and the Scarlet Pimpernel, a blue-flowered race of which grows along with the red on St. David's Island. Various familiar Composites have also become naturalized, but a true

native, producing masses of showy yellow flowers in summer, is a Golden-rod (*Solidago sempervirens*).

Two common escapes near habitations are *Freesia* and *Tropaeolum majus*; the latter luxuriates, flowering freely and bearing leaves as large as small plates.

The Mangrove swamps have been largely drained, but a good example remains at Hungry Bay on the south shore. It is a dense growth of the Mangrove (*Rhizophora Mangle*) and the Black Mangrove (*Avicennia nitida*), flanked on the land-edge by the Buttonwood (*Conocarpus erecta*).

The gardens of Bermuda would provide material for another lecture. At the time of my visit in March and April, they were in full beauty. Many of our familiar garden plants do well; I have never seen finer displays of Stock, Antirrhinum, and Gerbera, to name a few only. In addition are plants which are subjects for greenhouse treatment with us. Poinsettia is in flower in February, and in early March hedges of Hibiscus are brilliant. In the same month a successful show of outdoor flowers was held in Hamilton. A list of the trees that do well would be a long one. The stately Royal Palm (fig. 14), the Norfolk Island Pine, and species of Casuarina are frequently planted. The Scarlet Cordia (*Cordia Sebestena*) shades the sidewalks in streets in Hamilton; Pride of India (*Melia Azedarach*) is also a favourite. Fine specimens may be seen of the Calabash, *Ficus elastica*, *Poinciana regia*, Tamarind, and others too numerous to mention. *Acalypha Wilkesiana* (Match-me-if-you-can) makes an attractive hedge plant with its vari-coloured leaves. One misses our familiar fruit trees, but the Papau, Banana (*Musa Cavendishii*) and Loquat are commonly grown. Melons also do well.

The marine flora is remarkably rich, the rocky coastline with sheltered caves and pools is the home of a very varied seaweed flora; about 240 species have been listed, ten per cent. of which are endemic.

THE ALPINE HOUSE AT WISLEY.

By J. T. WALL.

[Read January 22, 1935 ; MARK FENWICK, Esq., in the Chair.]

THE present Alpine house at Wisley (figs. 15, 16) was built to provide what are considered ideal conditions for the growing of alpine plants ; that the ideal has been attained would be a dangerous statement to make, for we may yet live to see economical air-cooling and air-conditioning plant installed in our alpine houses. That the plants thrive in the house is without question, and the house has been copied by many keen amateurs either in its entirety or with alterations in the provision of staging methods.

How the views of what ideal conditions should be have changed may be seen by comparing the old and the new houses at Wisley.

The old house was built into the ground in a sheltered corner of the garden with tall Pines and Oaks in the vicinity ; these trees shaded the house and encouraged dampness, there was no glass in the sides of the house, but air was admitted beneath the staging by three ventilators with wooden shutters, and hot water pipes were installed on the same level as the staging. This house is now used for seed raising and propagating and is admirably suited to this use.

The new house is situated in one of the most exposed sites in the garden and for most of its length is above the surrounding ground level, thus ground dampness is avoided, there is no light obstruction from trees, and until a few years ago no plants were allowed on the outside walls of the house. Recently, however, light-foliaged evergreen and deciduous subjects have been admitted without any appreciable harm in the way of encouraging pests in the house. No plants are allowed to grow on the ground beneath the staging as plants suitable for such a site would undoubtedly encourage pests and plant diseases in the house and increase the humidity of the atmosphere, so the border is kept clean with rake and hoe throughout the year. The following structural particulars may prove of use and interest to the potential grower : the house is 60 feet long, 13 feet 6 inches wide, height of 9-inch brickwork 2 feet 9 inches from ground level, height to eaves 5 feet, height to ridge 9 feet. The whole of each side is made up of ventilators each 4 feet 9 inches wide, opening on a central pivot and operated by worm screws in front of staging. The lower edge of each ventilator is somewhat below the staging. The six ventilators on each side of roof are placed alternately and are independently operated by casement stays ; they are 5 feet 4 inches wide and 2 feet deep. Both the side and top ventilators are designed to give a **maximum of air in constant circulation without causing draughts.**

The staging on either side is 3 feet 2 inches high, 4 feet 3 inches wide, made up of 2½-inch by 1½-inch battens spaced ¾ inch apart,

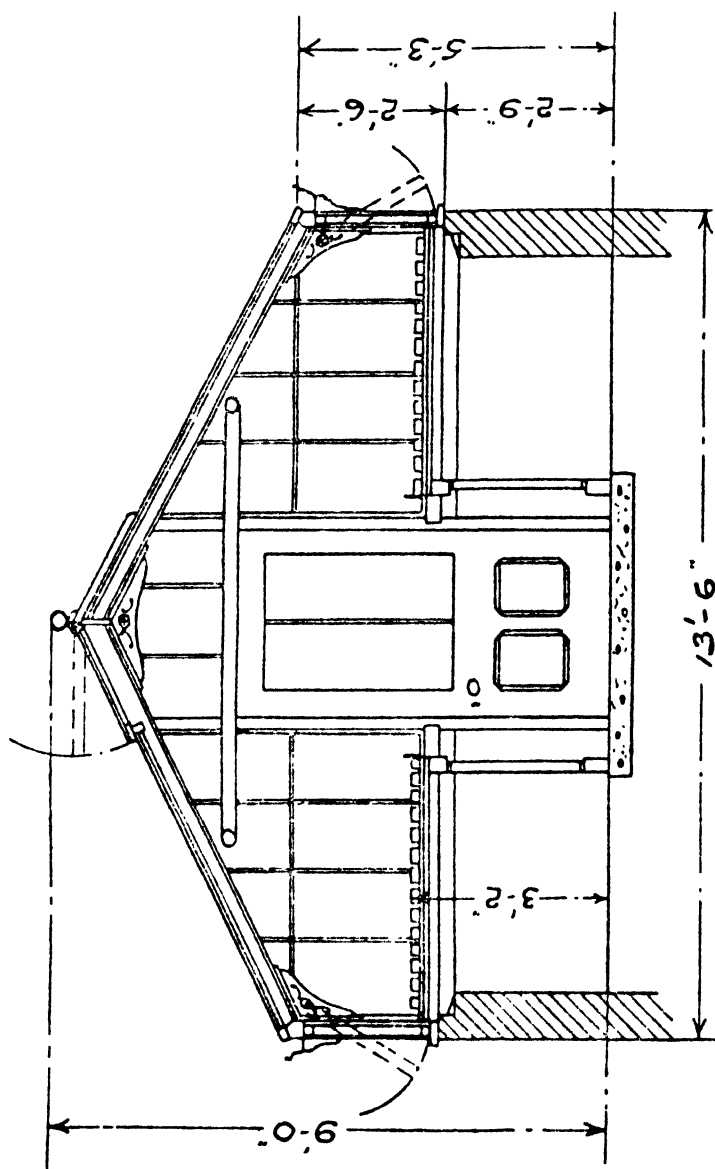


FIG. 15.—ALPINE HOUSE AT WISLEY.
(sectional view.)

supported by iron standards and 1½-inch by 1½-inch wood and T-iron bearers of the same dimensions painted deep buff.

The path is 4 feet 3 inches wide of concrete and cement, bordered by bricks, the roof is supported by angle irons and as an extra precaution four ties were introduced for rigidity.

Heating is supplied by 2-inch screwed hot-water pipes hung from each side, half way up the roof; the supply cistern is fixed over the door and an open safety valve from the return pipe is placed over

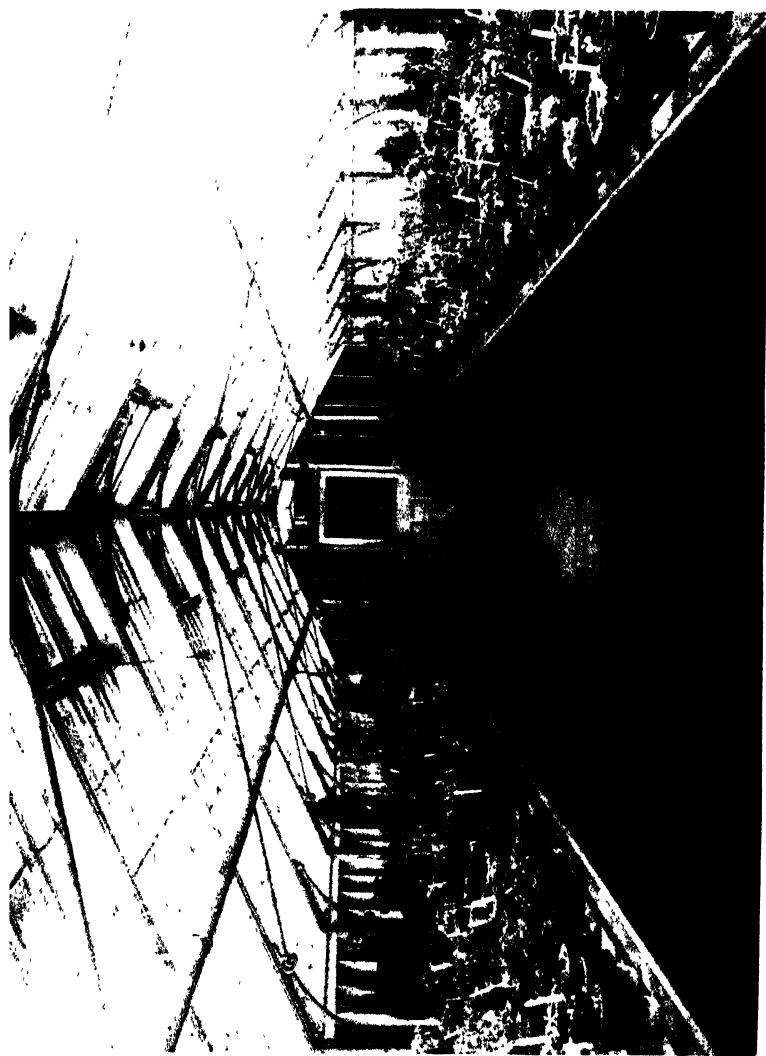


FIG. 16.—ALPINE HOUSE AT WISLEY

[To face p 100



FIG. 17 — JANKAFA HELDREICHII.



FIG. 18 — JEFFERSONIA DUBIA



FIG 10.—THYMUS MEMBRANACEUS

the tank. The water supply is contained in a brick and cement tank outside the house, an important feature in maintaining a dry atmosphere. There may be two opinions on the value of some of the arrangements in the house, especially perhaps upon the spaced open staging. In favour of this type of staging we find it much cleaner, it does not encourage worms (a great annoyance in pot cultivation), leather-jackets and slugs are entirely absent, woodlice find no hiding place, a much drier atmosphere can be maintained, and drainage is better. Yet another advantage is the confining of the roots in the pots. When shingle is used on the staging, roots soon penetrate into it and more roots are found outside than inside the pots. When the pots are moved the roots have to be cut away and such mutilation is harmful to the plant. In favour of shingle staging it may be said that it provides a cool base for the plants which is beneficial in the hot summer months, it also assists in keeping down pests that thrive in a dry atmosphere, and the appearance of the house is improved, but despite these advantages I am still inclined to the open base staging.

The necessity of heating apparatus may also be questioned, but if this is not a necessity it is a step towards the ideal, being useful on occasions when the air is charged with moisture by fogs or "Scotch mist." At these times the use of a little heat through the overhead pipes may save the life of many a rare plant; ventilators should remain open to avoid raising the temperature unduly.

Control and Care of the House.

At all seasons of the year full ventilation should be given. There are exceptions to this rule, however, and in very severe frosty weather the house may be closed. 12° to 14° of frost is not harmful to true alpine—more than this can be harmful, especially when the plants are in bud; in 1928–29 most of the *Burseriana* group of Saxifrages had their flowers spoilt when 27° of frost was registered inside the house; since then the house has always been closed when the glass stands at 32° at 5 P.M. It is also closed on the windward side when keen wind frosts prevail: this practice has proved beneficial.

All watering is done throughout the year early in the day, and all spilt water on floor or staging is mopped up in the winter months and added to during the heat of the summer; the plants will benefit greatly by the damping down of the floor and under the stages three times a day in very hot weather, and by a light spray overhead night and morning applied by an atomizer. This practice checks transpiration considerably, and it is not harmful to the most moisture-shy plant, and even *Eritrichium nanum* will stand it unless applied heavily enough to cause cohesion of the moisture particles. The need for cleanliness inside and out cannot be over emphasized; the stages should be washed down once a month and all woodwork and glass inside the house should be washed at least four times a year, while the outside glass will require one or two cleansings during the winter, and if the

house is situated near a town after each heavy fog. Light is a very important feature in procuring healthy specimens, and a clean house will assist in keeping down pests such as scale and mites.

Pests.

Soft scale insects (*Lecanium hesperidum*) and Red Spider Mite (*Bryobia praetiosa*) are the most troublesome to alpiners under glass; there are few growers who have not suffered from their depredations. Fortunately they do not seem to attack the same plants. For instance, I find that scale insects are very partial to Ramondias, Haberleas, Dianthus and the glaucous-leaved European Primulas such as *Primula integrifolia* and *P. spectabilis*. *P. minima* is included in this group and I have never seen scale on them, yet Mites are very fond of this Primula. Red Spider Mites are strongly addicted to members of the Campanulaceae. Any species of this family may be attacked with zest, be the foliage hairy or glabrous, though it must be said that the latter are the worst sufferers. The control of scale insects is best obtained by the use of white oil emulsion 1 per cent. and nicotine applied after hatching; this spray may also be used against Red Spider Mite. Another method is to dust the infected plants with nicotine powder. This method may appear a little unsightly, but it is very efficacious and the powder may be syringed off within twenty-four hours of its application. White oil emulsion is harmful to tender glaucous-foliaged plants and for these frequent sprayings with diluted nicotine soap wash is recommended, or nicotine powder. Green or Black Aphis is best dealt with by periodical fumigations, choosing cloudy cool evenings for the operation during the summer and a still night at all seasons, but nicotine sprays may also be used for isolated attacks.

Primula root Aphis (*Pentaphis auriculae*) proves troublesome on many Primulas and Auriculas, and the European species and hybrids are the worst sufferers. Bad attacks of this pest need drastic treatment. Shake the plant free from all soil, wash the roots, cutting away all decaying parts, paint any still affected parts with diluted methylated spirits, re-pot in clean fresh soil and burn the old soil. For less severe attacks a watering with 0.01 per cent. of sodium cyanide will prove efficacious. Carbon bisulphide used in an atomizer for spraying the roots will also prove a useful control; this pest is frequently introduced in new unstacked loam. When using carbon bisulphide the operator should refrain from smoking as the liquid is highly inflammable.

Rust.

This disease is not very prevalent amongst alpiners, but the encrusted Saxifrages apparently fall easy victims to it. All affected plants should be instantly burnt unless the outbreak is very mild, when infected leaves should be removed and the plants syringed with a sulphur-containing spray, and a light dry atmosphere maintained in the house.

Vine Weevil.

Of all the pests there is none to compare with the Vine Weevil larvæ, for working beneath the soil the damage done by his rapacious jaws is not observed until the harm is done. Although not prevalent in all districts it is at Wisley a most troublesome grub specially addicted to Saxifrages, Sedums and Sempervivums, but nothing comes amiss to its greedy paunch, and the roots of shrubs are apparently as palatable as the most luscious Sempervivum stem. Two ounces of arsenate of lead to 1 bushel of soil is a recommended control, but reports on the efficacy of this control are not encouraging; in one experiment twelve grubs were placed in treated soil with a healthy Primula; a few weeks later ten fattened grubs were removed; it must in fairness be stated that the grubs being well developed when placed in the treated soil would not prove so susceptible to the poison as newly hatched grubs biting their way to the roots. The trapping of adults by placing sacking on the floor and staging in June and July combined with the burning of all infected soil seem the only sure remedies; at least one does then know they are dead.

Shading.

The question of shading is often governed by the means and time of the grower. Lime wash made up of 3 lb. of unslaked lime to 4 gallons of water, may be applied with a brush or syringed on the glass; a bright hot day should be chosen for its application. This or proprietary liquid shades are most generally used, the advantage being their cheapness and the saving in time and labour. Against it, it must be said that the shading once applied is there until the end of the summer—late September. During this period dull days and even weeks occur when it would be advantageous to the plants if removed, and no shading is required even in the height of summer after 7 P.M. until 10 A.M.

Where blinds of tiffany or wooden slats are used the foregoing advantages may be realized and a cooler atmosphere maintained by the current of air passing between the shading material and the glass. Then there is against blinds the cost of material and the time and labour involved in lowering and raising the blinds morning and evening. When gardeners are employed the extra trouble amounts to little, but when the grower is a business man who does the whole of the work himself it is a trouble often deputed to one who may forget the blinds with dire results. Time, labour and means provided, blinds are to be recommended over permanent shading.

Watering and Care of the Plants.

The success of alpine plant growing is commensurate with the grower's skill with the water-pot; there can be no controversy on

that. Overwatering will kill a plant, underwatering will prove harmful but can be remedied. It is in the early spring, autumn and winter when most care must be exercised ; dampness at these seasons is the bugbear of alpine plants and no water should be allowed on the foliage, and a careful scrutiny of the plants once a week will suffice for watering. Plants will often go six or eight weeks without watering, although I do not believe in allowing any alpine plant that retains any foliage to get "dust dry." Water should never be given to a plant that is frozen ; it may be said that no one would think of watering under these conditions, yet I have known tepid water applied to apparently dry plants while still frozen. Tapping the pots with the fingers or a small wooden hammer on a stick (the latter method is not so accurate) will guide one if water is required or not ; if there is any doubt weigh the plant by raising in the hand—experience will soon teach one what each size of receptacle should weigh before requiring water. Very special treasures may be placed almost to the rim in water and taken out as soon as moisture appears on the surface of the soil.

There is little required in the way of attention to the plants other than what has already been covered by the notes on watering and pests. During the winter months attention may be given to the removal of the surface dressings of such plants as need it, and a little fresh soil introduced and the stone mulchings replaced round the plant ; this will remove all moss (*Funaria*) and Liverwort (*Marchantia*) that may have formed. They are growths that starve the plant roots of air and warmth besides being unsightly. I will qualify the "unsightly" verdict for there is something in the enthusiasm of the poet who wrote :

"The tiny Moss, whose silken verdure clothes
The tume worn rock, and whose bright capsules rise
Like fairy urns on stalks of golden sheen."

But do not be misled, there is no room in the alpine house on any pretext for mosses.

In severe weather plants are apt to get lifted from the soil, therefore it is very important after severe frosts to go round and press down firmly without pinching into the "neck" of the plant all that have suffered in this way.

Worms are also troublesome inhabitants of pots, and when their activities are observed during mild spells of weather your earnest attention should be given to their removal and the drainage of the pot attended to or a sickly plant will soon ensue.

A plant in ill-health should receive immediate attention no matter what the season is. Shake out and re-pot in a smaller receptacle in a light clean soil, give special attention for a time and insert a few cuttings if possible ; do not wait for the plant to recover from its megrim : it won't.

Do not allow unwanted seeds to ripen and scatter over other plants in the vicinity, they will be a source of trouble when they germinate.



FIG. 20 — *SAXIFRAGA FORTUNEI*



Fig. 21. *Primula juncyua*



FIG. 22 -- ASTER PAPPY



FIG. 23 —ACANTHOLIMON GRAMINIFOLIUM

[To face p 105.

Campanulas are frequent offenders in this way. *Oxalis corniculata* is an even worse offender; shooting its seeds over surprising distances it proves difficult to eradicate when once established. Constant hand weeding is the only method of control. Cut away all dead flowers and foliage immediately: it will help considerably in maintaining healthy plants. Dead foliage is a harbour for Woodlice, a pleasant home for Earwigs and other pests.

Potting and Composts.

The potting and repotting of alpiners may be done at almost any season while the plant is active. *Kabschia* and *Engleria* sections of *Saxifragas* are best left undisturbed from June to August inclusive, and from November to January; immediately after flowering or as activity commences after the heat of the summer are the best seasons for these operations. As a general rule the flora of the house may be divided into two groups: such as flower in early spring repot in late summer or autumn; to those flowering in summer or autumn give attention in early spring. For the experienced the time to repot a plant is when the necessity arises.

Do not place any plant into its permanent receptacle until well rooted, then pot firmly to ensure compact growth, avoid pinching into the collar of the plant, fill up the pot to within $\frac{3}{4}$ inch of the rim, then wedge pieces of broken rock half their width into the soil, filling in the interstices with crushed pieces of the same material to form a mulch to within $\frac{1}{4}$ inch of the rim, pushing the chippings well under and round the crown of the plant; do not water for twenty-four hours if possible—and it should be possible unless the fault of potting a dry plant has been practised.

These stone mulchings are not only ornamental but serve a definite purpose in the cultivation of alpiners, most of which are true "rock plants." The large pieces wedged into the soil assist in keeping the roots cool and the soil in a proper state of aeration. The smaller pieces while also fulfilling the same purpose assist in taking off more quickly the superfluous moisture from the surface; stone mulchings are also an aid in keeping down weeds while conserving the moisture in the soil. We are all aware how the surface soil in a pot congeals under the action of frequent watering unless constantly disturbed to admit air, and this would be a necessary operation in the alpine house if they had no stone mulchings. The surface soil of a "well-dressed" pan should be almost as open after months of watering as the day the plants were potted; so not only is the mulch ornamental and beneficial, but is also an eventual labour-saver well worth the extra attention.

In growing alpiners it is far better to keep single specimens growing on than to place several plants together into a pan. Single specimens grow more evenly, while it frequently happens that one or more plants will "go off" where a number are placed together, and these losses are seldom replaced with any success.

Soils.

Composts for alpine are many and varied. All growers have their own pet theories on the diet their special treasures require ; these are best judged on their merits, for experimenting we are and always will be. So many outside influences affect this question, such as situation and elevation of the house, the different after-potting attention given to the plant, locality, and a heavy or light hand in the use of the water-pot. All have a definite bearing in preparing composts, so no hard and fast rules can be laid down. A good general compost may be composed of three parts loam to one of leaf mould to one of sharp sand, then may be added one part of mo. car-rubble, limestone chips, crushed granite, potsherds, sandstone or peat according to the plant's requirements or the whim of the grower. The merits of these ingredients are best judged by one's own experience. Alpine plants frequently remain in the same receptacle for five, six or more years without showing signs of distress if well potted. It is therefore, I aver, more important to provide a good clean weed-free loam for alpine than for any other form of horticulture, and if adhered to the few pounds extra outlay will prove a potential economy. When mixing the soil the loam should be broken up with the fingers in order to retain the fibre, the coarsest of which may be picked out and placed over the drainage ; the other ingredients may be sifted to the desired texture. It is a good plan to sterilize the soil where possible, but the soil should not be used for at least 24 hours after this operation. Good drainage cannot be overstressed ; to obtain this it is not necessary to half-fill the pots with it, one-fifth of their depth should prove ample for most alpine.

The primary object of a soil compost is to provide food for the plant and although all ingredients mentioned above are by no means essential I am convinced that they assist the plant in the assimilation and the freeing of the food in the soil.

That any plant is definitely lime-loving is beyond my belief, and that a plant coming off a limestone formation must have lime is a fallacy. Many such plants protect themselves against the lime content by living on their dead foliage which turns to peat as it decays. *Ramondias* and *Cotyledon Saxifragas* are cases in point, and excellent specimens of reputed lime-loving encrusted *Saxifragas* are grown on the sandy-peat soil of Dutch nurseries. There are few alpine, however, that will object to the presence of lime in the soil unless there is sufficient to cause a hardening of the root tissues, when a more acid-forming component such as peat or leaf soil should be used in larger quantities. Plants, like humans, have their idiosyncrasies frequently bred by over-indulgence ; even growers with a reputed " magic thumb " have failed to reconcile some of them to cultivation. Well, it is the failures more than the successes that keep the true gardener young.

Accommodation.

These notes are intended chiefly for those who grow their plants in the house all the year round ; others are more fortunate and can develop further accommodation. It is a useful asset to have a few frames or plunge beds where young plants and bulbs suitable for the alpine house may be grown. Many bulbous and rhizomatous Iris species, Narcissus and Crocus species, Fritillaries, Bulbocodiums, Cyrtanthus, and terrestrial Orchids are fine additions to the flora of the house, but are not suitable for growing there throughout the year.

All the plants mentioned will benefit from being plunged in ashes, sand or fibre during their growing season. After flowering, frame lights should be placed over them to keep off summer rains when the foliage has gone, or if these are not available, place them on their sides against a west wall until the re-potting season. Crocus species seldom survive in pots more than one season ; these should be planted in the garden directly after flowering and a new stock purchased each season.

Campanulas are an important genus in the house for they provide flowers during the late summer and well into autumn. A considerable number, however, are best grown in plunge beds or frames until they commence to flower ; when grown in the house the shading is apt to cause etiolation which makes them even more susceptible to attacks of Greenfly, Mite and Rust.

Useful as frames and plunge beds are, they are not essential to the maintenance of interest in the alpine house, for some interesting plant may always be had in flower or foliage without overcrowding in a house that need be no larger than 16 feet by 10 feet. A house of these dimensions should always be built on a site that will allow for an extension, for it is certain that the owner sooner or later will want to extend, and should be prepared for this probability without meeting undue difficulties in the way of space.

What to Grow.

The question of what to grow is made easy by the study of the excellent lists of the leading alpine and rock garden specialists. I propose to mention, therefore, only a few of the innumerable plants in their flowering season.

March to May is the zenith of the alpine house display. At this season many of the Kabschia, Engleria and Porphyryon sections of Saxifrages will be in flower and the numerous hybrids between these groups. Numerous bulbs if permitted may be had, and the miniature Narcissi such as *Narcissus juncifolius*, *N. rupicola* and *N. Watieri* must be grown ; they answer well to pot cultivation.

Many of the Aretia section of Androsace will challenge alike the cultural skill of expert and novice. The pink *Androsace ciliata* is a great beauty. *A. argentea* (= *multiflora*), *A. cylindrica* and *A. hirtella* are white and exacting but not untamable. Anemones such as

excellent pot plants. The former requires a rich well-drained soil, while a gritty open compost is required by *G. saxosa*. Both have white flowers in July or later.

Several *Geraniums* may be included. *Geranium Farreri* (*napuligerum*) flowers in earliest June and, if you are fortunate, again in September.

Globularias such as *Globularia minuta*, *G. bellidifolia* and *G. incanescens* are attractive over long periods from June.

Lewisias are represented at this season by *Lewisia Finchii*, *L. Heckneri*, and *L. cotyledon*, besides numerous hybrids, even more beautiful than their parents.

Lobelia linnaeoides has lilac and white flowers on fragile stems continuing until October. *Mimulus primuloides* also has a prolonged flowering period from July and answers well to alpine house conditions.

Several *Ourisias* prove difficult but fascinating plants in the house. The following should be attempted: *Ourisia alpina*, *O. coccinea*, *O. fragrans* and *O. microphylla*.

Phacelias are usually well known as annuals. The perennial *Phacelia sericea* is as temperamental as its undoubted beauty warrants. *Phlox mesoleuca* compensates one for its ungainly habit by producing huge white-eyed rosy-lilac flowers in June.

Phyteuma comosum repays generous cultivation with large heads of purple mouse-tailed flowers and rich foliage. *P. humile* and *P. pauciflorum* should also be obtained, they are as delightful as they are unique. All *Phyteumas* are excellent feeding for slugs.

Putoria calabrica is a delightful shrub with narrow shining green leaves and clusters of rosy-pink *Asperula*-like flowers produced from July, to be followed by red fruits. The plant is well worth growing for the foliage is only repugnant when crushed. *Saponaria pulvinaris* also produces numerous deep pink flowers at this season.

Many of the encrusted *Saxifrages* will still be in flower, the varieties of *Saxifraga cotyledon* being at their best. Sedums and *Sempervivums* are too numerous to mention; many of them are attractive, none uninteresting.

Verbascum spinosum is a delightful golden-flowered, grey-leaved shrub, slow growing but ever generous with its floral display from July onwards.

Townsendia exscapa and *T. sericea* are too often neglected miniature asters; they flower in June. *Thymus membranaceus* (fig. 19), is the showiest of all *Thymes*. Its beauty lies more in the large bracts than in the white flowers.

September to February.

These six months are the most difficult to fill with a good display of flowers and the two months mid-November to the middle of January depend chiefly on a few out-of-season flowers, and these only sufficient

to whet one's appetite for the good things to come. The following list may assist in the selection of plants for this season.

Aethionema (Eunomia) oppositifolium is quite a pygmy with round blue-grey leaves and clusters of lilac flowers from February until May.

Allium cyaneum flowers in late summer, the blue flowers lasting well into October. *Aster sericeus* with violet-blue flowers on foot-long wiry stems and silvery-grey silky foliage is attractive. This plant flowers in September with many of the Campanulas such as *Campanula* \times *Norman Grove*, *C. \times haylodgensis*, *C. isophyllus Mayi* and *C. fragilis*. These will continue well into October. Many others of this genus may be induced to give a late display by propagating in late spring or by cutting down and re-potting the summer-flowering species in May.

Celmisias are excellent plants for the house, some giving a late display of flower. All the silvery foliated species are valuable in the winter.

Chrysanthemum Mawii sown in the spring will flower until severe frost enters the house. Plants that flowered in the early summer if cut down in July will also provide flowers in October.

The species of *Cyananthus* are becoming much better known, and although many are not suitable for pot cultivation the late flowering purple *Cyananthus longiflorus* should be grown in a rich open soil with plenty of drainage. Similar treatment should also prove successful with the beautiful grey-leaved, blue-flowered *C. Wardii*.

Cyclamen coum, *C. ibericum* and *C. libanoticum* flower from January to March, while *C. graecum* and *C. Rohlfsianum* flowering from September are most useful.

Iberis saxatilis is a miniature shrub whose white flowers may open any time after January and keep company with the taller, stronger, *I. semperflorens* throughout the winter.

Iris histrio and *I. histrioides* are ideal bulbs for the house in late January. They are followed by *I. bucharica* and *I. orchiioides* in February.

Mitchella repens is an under-rated plant of creeping habit; it has shining evergreen leaves, inconspicuous white flowers followed by red berries.

Omphalodes Luciliae with beautiful soft blue flowers and glaucous foliage proves to be temperamental, growing bushy and cabbage-like on occasion, at others just lingering. The early spring and late autumn display of flowers are the best, the summer flowers suffering from over much magenta in their colouring.

Oxalis lobata flourishes and displays its golden flowers to greater advantage in the house where they commence to open in September.

Polygala Chamaebuxus and the variety *purpurea* are rarely without a few flowers from November until the main display in March.

Many of the dwarf *Primulas* will commence to flower in February. *Primula Allionii*, *P. marginata*, *P. Palinuri*, *P. hirsuta* and *P. Winteri* will be amongst them. This month will also see many of the *Saxifrages*

in flower. Much more colour has been introduced by the intercrossing of the sections Engleria and Kabschia, and, of course, the most brilliant of this genus, *Saxifraga Grisebachii*, Wisley var., will be opening its green-tipped, crimson and purple bract-like inflorescence. At the time of writing these notes (December) we have in flower the following Saxifrages: *S. cuscuteiformis* and *S. Fortunei* (fig. 20), both excellent for a late display, *S. Brunoniana* v. *majuscula* and *S. gemmipara*, while *S. × Kellereri* which frequently flowers throughout the winter is just opening its pink flowers.

Other plants and bulbs may be had at this late season by careful selection to give interest in flower, fruit, bract or foliage; dwarf conifers in silver-grey or glaucous blue, *Crawfordia trinervis* and *Margyricarpus setosus* with fruits, *Acantholimon graminifolium* (fig. 23), *Paronychia nivea* and *Illecebrum verticillatum*, with flowery bracts, will help to show that the alpine house is not only a spring house but of interest the whole year round.

LAVENDER PESTS.

By H. F. BARNES, M.A., Ph.D.

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IN the autumn of 1932 large quantities of caterpillar frass was noticed on the pavement underneath a hedge of Lavender at the Rothamsted Experimental Station. In view of the fact that few caterpillars are known to attack Lavender, it was decided to keep the hedge under observation in order to discover what kinds of caterpillars were feeding on it.

The Lavender was originally planted in 1929 and was uprooted and transplanted late in the summer of 1933. The hedge ran north and south. It was situated in a closed-in position, so that at no time of the day was the whole of it exposed simultaneously to sunshine, but in spite of this the hedge prospered.

Within a year caterpillars of the following species were found on this hedge: (1) the Buff Ermine (*Diacrisia lutea*), (2) the Garden Tiger (*Arctia caja*), (3) the Lesser Yellow Underwing (*Triphacna comes*), (4) the Cabbage Moth (*Mamestra brassicae*), (5) the Dot (*Mamestra persicariae*), (6) the Bright Line Brown Eye (*Miselia oleracea*), (7) the Small Angle Shades (*Euplexia lucipara*), (8) the Gothic (*Naenia typica*), (9) the Mouse (*Amphipyra tragopogonis*), (10) the Beaded Chestnut (*Amathes lychnidis*), (11) the Silver Y (*Plusia gamma*) and (12) the Willow Beauty (*Boarmia gemmaria* var. *perfumaria*). All these species are known to be general feeders, attacking both cultivated plants and weeds. Besides these species which were found living on the Lavender, the White Ermine (*Diacrisia lubricipeda*) was reared successfully on it.

Few references are to be found in European literature to caterpillars feeding on Lavender. The Oecophorid *Borkhausenia lavandulae* is said to feed on *Lavandula Stoechas* in Corsica, and the Gelechiid *Sophronia humerella*, which also feeds on *Artemisia campestris*, has been recorded (R.A.E., A., 14, 1916, 380) as being abundant on Lavender in the Drôme district of France.

I am indebted to Mr. W. H. T. TAMS of the British Museum (Nat. Hist.) for aid in the nomenclature, to Mr. G. FOX WILSON for help in preparing the manuscript, and to Mr. V. STANSFIELD for taking the photographs of the moths and caterpillars, all of which are shown about life-size.

(1) THE BUFF ERMINE.

This caterpillar (fig. 24, 1) is hairy and brownish in general appearance, and is about an inch long when full grown. In addition there is a pale whitish-grey stripe down each side and a light coloured line down the back. When small the caterpillar is paler (as shown in

the photograph), and may be tinged with yellow or grey. The head is pale shining brown. The caterpillar, which runs quite fast, curls up when touched, and may be found from July to October. It spins a dirty-coloured cocoon among leaves and rubbish on the surface of the soil and uses its hairs to cover the cocoon in which it spends the winter as a pupa. The moth (fig. 26, 1) emerges the following June or July. Its ground colour is some shade of buff and there are black markings on the wings. The body is yellow with black spots.

Upwards of a dozen caterpillars were found on the Lavender hedge in late July and early August, 1933.

(2) THE GARDEN TIER.

This caterpillar (fig. 24, 3) is the familiar 'Woolly Bear.' It is velvety black, with very long black, white-tipped hairs on the back. On the sides the hairs are chestnut brown. The head and legs are glossy black. It is extremely active and curls up on being touched. The caterpillars can be found from July until May, although they are not often seen before hibernation. The cocoon is spun among the food plants. The moth (fig. 26, 7) emerges in June and July. The dark brown and white upper wings, and the pink to red lower wings with their black spots, make this moth unmistakable.

Caterpillars were found feeding on the Lavender hedge on May 5, 1933, and again in 1934.

In England this caterpillar has been recorded as being injurious to cocksfoot and seedling crucifers in frames. In France it has caused trouble in vineyards, and has also been reported as harmful to Lettuce, Jerusalem Artichoke and Fig. In Germany the medicinal plants *Aconitum* and *Hyoscyamus* have suffered; in Sicily Vine; in Russia Aconite, Melons, Cucumbers, French Beans, and Wild Vine; in Bulgaria Plum, Nut and *Taraxacum*; while Beet has been attacked in Czechoslovakia.

(3) THE LESSER YELLOW UNDERWING.

This caterpillar when full grown is about 2 inches long and a dirty stone colour, but this general coloration is variable. There are three pale lines on the back, the centre one being edged with blackish, and the lateral ones with dark oblong marks. The spiracles are white and immediately below them is a pale stripe. The head is stone colour with brown markings. It is a typical cutworm and is a night feeder. It is found from August to April or May. The winter is passed in the young caterpillar stage. The pupa is in the top few inches of soil. The moth (fig. 26, 11), which emerges in July and August, is variable. The upper wings are some shade of brown, while the lower wings are yellow with a black band round the outer margin with a crescent-shaped black spot towards the middle.

Two moths emerged on July 7, 1933, from caterpillars collected on the Lavender hedge early in May.

It has been recorded as injurious to Vine in Sicily, to Lettuce in France, and to Tobacco in Turkey.

(4) THE CABBAGE MOTH.

This caterpillar (fig. 25, 1) is dull brown or greenish. The central line down the back is dark, while the lateral parts of the caterpillar are paler than the rest of the body. The head is brown. The spiracles are white surrounded by black. The caterpillars occur from June to October. The pupa, which is shining brown, is to be found in the soil throughout the winter and during the summer. The moth (fig. 26, 8), which appears from May to September, is greyish-brown with a whitish kidney-shaped mark on the forewings. There are several overlapping broods during the year.

The caterpillar was found on the Lavender hedge in the autumn of 1933 and the moth emerged on July 15, 1934.

It is a common European pest of market-garden crops, especially Cabbages. It has also been recorded damaging Turnips, Rape, Lettuces, Peas, Onions and green Tomatos in addition to feeding on numerous weeds.

(5) THE DOT.

This caterpillar (fig. 25, 5) is green or brown, with beautiful shading of darker green or brown. There is a pale line down the centre of the back, extending from the head to the hump on the twelfth segment. The spiracles are white ringed with black. The head is shining grey, green or pale brown; just behind it is a thoracic shield of olive green or dark brown on which are three white lines. The caterpillars usually feed at night and can be found from July to October. By day they hide in the foliage, in which they are very inconspicuous. The green specimens usually rest on the green foliage, whereas the brown ones are to be found on the brownish parts of the plant. Pupa-tion occurs in the soil, and the winter is passed in this stage. The moth (fig. 26, 9) has bluish-black upper wings with rusty brown markings and a prominent large white kidney-shaped dot almost in the centre. The hind wings are dusky grey, becoming paler towards their base. It is on the wing in June and July.

Upwards of twenty caterpillars were found on the Lavender hedge early in October 1932, the moths emerging the following June.

In England it has been recorded as injurious to Chrysanthemums, Dahlias, Marguerites, Marigolds, Pansies and Geums among garden plants; to Cabbage, Lettuce, Mint and Parsley among vegetables; and to Gooseberry, Apple, Plum, Raspberry and Currant among fruit. In France damage has been reported to Lettuce and Hemp; in Germany to Hemp, and in Russia to Beet, Cabbage, Cereals and *Inula Helenium*.

(6) THE BRIGHT LINE BROWN EYE.

This caterpillar (fig. 25, 3) is also variable in colour, ranging from green to light brown. The distinguishing features are the black and white spots all over the body and the yellow stripe down each side. The spiracles are white surrounded by black. The caterpillars

can be found from July to September, and the winter is passed in the pupal stage in the ground. The moths emerge the following June and July. In colour this moth (fig. 26, 4) is brownish, the forewings possessing a bright line and brown spot or eye. The hind wings are dusky grey.

A caterpillar was found on the Lavender hedge on August 4, 1933.

In England this caterpillar is well known as a pest of Tomatos in glasshouses (hence the name 'Glasshouse Tomato Moth'). In addition it has been known to attack Cucumbers and Chrysanthemums under glass; in the open it has been reported as injurious to Cabbage, Mignonette, Swedes and Mangolds. In France it has been reported on Lettuce, Cabbage, and Raspberry; in Holland on Tomatos; in Germany on Lettuce; in Denmark on Beet and glasshouse Tomatos; in Norway on Cabbage, Potatos and Tomatos; in Sweden on Cabbage; in Czechoslovakia on Onion, Poppy and Beet; and in Russia it has been recorded as damaging Tomatos, Cabbage, Beet, Apples, Belladonna and Valerian.

(7) THE SMALL ANGLE SHADES.

The caterpillar (fig. 25, 2) is green or brown. The distinguishing characters are the velvety appearance and the two prominent white spots on the back at the tail end. There are also some dusky V-shaped marks on the back, white spots dotted about the body, whitish lateral lines, and pale pinkish or blackish spiracles. It feeds at night and is to be found in August and September. The winter is passed in the pupal stage below ground. The moth (fig. 26, 5) emerges the following June and July. The upper wings are pinkish or purplish-brown with a pale mark on the outer edge of the blackish central area.

A single caterpillar was found on the Lavender hedge in late September 1932, and the moth emerged on May 27, 1933. Another single caterpillar was found on the same hedge on August 4, 1933, and the moth emerged on June 14, 1934.

It is often destructive to Ferns in gardens and under glass in this country. In France it has been recorded as a pest of Lettuce.

(8) THE GOTHIC.

This caterpillar (fig. 25, 7) is putty coloured, ochreous brown or greenish-grey, mottled with brown. At the sides above the pale lateral line there is a dark line broken by the ochreous spiracles. Slightly behind the head there are two distinct white spots laterally. Towards the tail end there are in addition some dark oblique streaks on the sides. The caterpillars feed in colonies when young before hibernation and can be found from August to May. Pupation takes place in the soil. The moth appears in June. The upper wings (fig. 26, 2) are various shades of dark brown with white lattice markings, while the lower ones are grey.



1



2



3



4



5

FIG. 24—CATERPILLARS ON LAVENDER
1, Buff Ermine. 2, White Ermine. 3, Garden Tiger. 4, Silver Y.
5, Willow Beauty (3).

[To face p. 116.



1



2



5



3



4



6



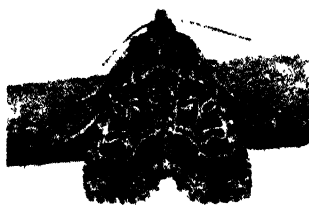
7

FIG. 2. CATERPILLARS ATTACKING LAVENDER

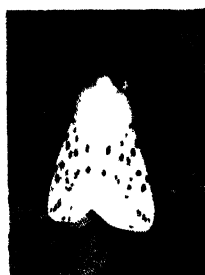
1, Cabbage Moth 2, Small Angle Shades 3, Bright Line Brown Eye 4, Mouse
5, Dot 6, Beaded Chestnut 7, Gothic



1



2



3



4



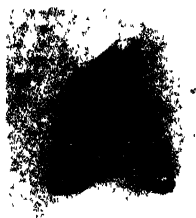
5



6



7



8



9



10



11



12



13

FIG. 20.—MOTHS ON LAVENDER

1, Butt Ermine 2, Gothic 3, White Ermine 4, Bright Line Brown Eye
5, Small Angle Shades 6, Mouse 7, Garden Tiger 8, Cabbage 9, Dot
10, Beaded Chestnut 11, Lesser Yellow Underwing 12, Willow Beauty
13, Silver Y [7 and 12 slightly reduced]



FIG 27 — ROSE 'DAINTY BESS' AT TRENT PARK

About twenty almost full-grown caterpillars were found on the Lavender hedge in May 1933; the moths emerged throughout June. Some eggs and a colony of very young caterpillars were also found in early August 1933.

In England it has been recorded on Apple, Pear and Plum before hibernation, and later on Lettuce, Cabbage and Spinach. It is known as a pest of Chrysanthemums in the open and under glass. In Bohemia it has been recorded as attacking Hops, and Chrysanthemum and Cyclamen in Denmark.

(9) THE MOUSE.

This caterpillar (fig. 25, 4) is pale green with white longitudinal lines. The spiracles are very pale green edged with black, and lie on the white spiracular line. It can be found from April to June. Pupation takes place in the soil and the moth (fig. 26, 6) emerges in July and August. It is greyish-brown with three black spots on the upper wings. The lower wings are paler.

Caterpillars of this moth were found on the Lavender hedge in June 1933, and the moths emerged in July.

It has been recorded as injurious to medicinal Aconitum in Germany and Russia, to Spinach in France, and to *Nicotiana rustica* in the Ukraine. In this country the writer has found it (1934) on Asparagus.

(10) THE BEADED CHESTNUT.

This caterpillar is yellowish-green with a broad whitish spiracular line on each side. The spiracles are white surrounded by black, with a black spot immediately behind them. The specimen figured (fig. 25, 6) is about to change its skin for the last time. It is found from April to June. Pupation takes place in the soil and the moth (fig. 26, 10), which is exceedingly variable, appears in September and November. Some are reddish, others ochreous, while others are brownish with white veins.

Caterpillars were found on the Lavender hedge on June 9, 1933, and the moths emerged about the middle of September.

(11) THE SILVER Y.

This caterpillar (fig. 24, 4) is a semi-looper and has three pairs of clasping legs. In colour it is pale green, usually spotted with whitish, but sometimes it is dark olive. There are several whitish lines on the body, which is clothed with short fine hairs. The spiracular line is yellowish. The head is green marked with black. The caterpillar can be found from May to September. When full grown it spins a white translucent cocoon among the leaves of the food plant. The pupa is green with black markings. The moths are seen more frequently in the autumn, but also in spring, the latter being most probably immigrants from abroad. The moth is velvety grey to brown with a conspicuous

silver Y on each fore wing (fig. 26, 13). The hind wings are brown, paler towards their base.

A fully grown caterpillar was found on the Lavender hedge on August 4, 1933, the moth emerging on September 24.

It has been recorded as injurious to Clover in Wales, to Flax in Ireland, and to Strawberry and Mangold in England. On the Continent it has been reported as attacking many economic plants both of agricultural and horticultural importance. The list includes the following. In France it has been noted destroying Lettuce (also in Cyrenaica), Jerusalem Artichoke, Flax (also in Latvia, Lithuania and Russia), Hemp (also in Germany, Italy and Russia); in Germany the medicinal plant Hemlock (*Conium maculatum*), as well as Beet (also in Czechoslovakia, Morocco and Russia) and Potatoes (also in Holland); in Czechoslovakia Hop and in Bulgaria Cereals. It is a pest of Carnations in Cyrenaica and of Cummin in Malta. In Russia it is recorded on Strawberries, Lucerne, Cabbage, Sunflower, Onion, Makhorka Tobacco and Cotton. Other records include Soy Beans, Groundnuts, Peppermint and Safflower in the North Caucasus, and the medicinal *Verbascum phlomoides* and *V. thapsiforme* in the Ukraine.

(12) THE WILLOW BEAUTY.

This caterpillar (fig. 24, 5) is a true looper and has only two pairs of clasping legs. In colour it is reddish-brown, mottled with ochreous. It is to be found in August and after hibernation in the spring. It spins a flimsy cocoon among its food plant or among the fallen leaves and other debris on the surface of the soil. The moth (fig. 26, 12) emerges in July and August. The variety *perfumaria* is smoky or dark slaty grey.

Twenty caterpillars at least were found on the Lavender hedge during June 1933, and the moths emerged throughout July. Some more caterpillars were found on the hedge in June 1934.

It has been recorded on Roses in France, and on Tea in Transcaucasia.

The twelve preceding species were found on the Lavender hedge in the caterpillar stage and were successfully reared on Lavender.

THE WHITE ERMINE.

This species was not found on the Lavender hedge, but has been successfully bred on it. The caterpillar (fig. 24, 2) is hairy and black with a pale line down the middle of its back. It occurs in August and September. The close-fitting cocoons, which are covered with hairs from the caterpillars, are found on the ground at the base of the food plants or on fences. The moth (fig. 26, 3) which emerges the following June is white with black spots, with yellow bodies also bearing black spots.

COMMERCIAL FRUIT TRIALS AT WISLEY, 1934.*

THE area occupied by fruits under trial remains at approximately twenty-two acres, with an additional sixteen acres occupied by the Nursery, and trees and bushes in the standard collection of varieties of all kinds of fruit maintained for the purpose of comparison and synonymy, the total area being approximately thirty-eight acres. The new material planted has occupied land from which trees and bushes—after a suitable period of testing—have been removed.

The Joint Committee met at Wisley on June 29 and on August 17 to inspect the trials and conduct other business relating to the general management of the trials at the central and sub-stations, and at the meeting on August 17 sub-station officials attended to meet the Joint Committee and inspect the trial grounds.

One variety, the Plum 'Laxton's Bountiful,' a medium size, red Plum, ripening before 'Victoria,' was selected by the Judging Committee for propagation and distribution to the sub-stations for extended trial.

The following varieties, after a suitable period of testing, have proved unworthy of recommendation or further trial, and have been, or will be, eliminated as space is required for new plantings :

Apples.—' Ball's Pippin,' ' Bushey Grove,' ' Crimson Newton Wonder,' ' Eady's Magnum,' ' John Standish,' ' Laxton's Premier,' ' Marston Scarlet Wonder,' ' Mr. Prothero,' ' Seabrook's Excelsior,' ' Seabrook's Red,' ' S. T. Wright,' ' Victory.'

Raspberries.—' Allenberry,' ' Lynn's Superb,' ' Day's Seedling,' ' Oswaco,' ' Bountiful,' ' Heytor,' Seedlings 5 A/20, 1 A/20, Y 3, ARC 18, ' Profusion,' ' Prolific,' ' Paradise Berry,' ' Helston,' ' Norwich Wonder,' ' Prior's Prolific,' ' Darnaway.'

Strawberries.—' Acquisition,' ' D2, 370/25,' ' Johnson's Seedling,' ' Duchess of York,' ' Phenomenal,' ' Shamblehurst Monarch,' ' Lord Grenfell,' ' Winsome.'

Black Currants.—' Taylor,' ' Perfection,' ' Trinder's Long Bunch,' ' Mite Free,' ' Coulter Mains,' ' Westwick No. 3,' ' Orr's Seedling,' ' Hatton Black,' ' Hatton Giant,' ' Blacksmith,' ' Westwick 5,' ' Eagle,' ' Kerry,' ' Ontario,' ' Peplow Black,' ' Trail's Perfection.'

Red Currant.—' Fillbasket.'

Twenty-two varieties have been accepted for trial during 1934, viz. :

Apples (2)

' Worcester Cross'—a dessert Apple raised at Long Ashton Research Station.

* For last report see JOURNAL R.H.S., 59, p. 82.

'Chorister Boy'—a mid-season, brightly coloured, dessert Apple of unknown parentage; found in Wiltshire and sent by Barnham Nurseries Ltd.

Pears (2)

'Laxton's Foremost'—a September dessert Pear raised by Messrs. Laxton, Bedford.

'Bristol Cross'—a dessert variety raised at Long Ashton Research Station.

Plums (9)

'Laxton's Abundance'—raised by Messrs. Laxton.

Seedlings C1, C2, C3, C4—raised by Mr. Boyes at Cambridge.

'Teme,' 'Wye Cross,' 'Severn Cross,' 'Avon Cross'—raised by Mr. Spinks at Long Ashton.

Damson (1)

Seedling D1—raised by Mr. Boyes at Cambridge.

Strawberries (8)

'Marshall,' 'Corvallis,' 'Redheart,' 'Ettersburg 121,' 'Clark'—from Mr. Waldo, Oregon; recommended by Mr. Hirst, Campden, particularly for canning.

'Phillnitz'—introduced by Mr. Reeves.

'Kingsley Prolific'—introduced by Mr. Jones, Kingsley.

'Spangsborg V'—a continental variety sent by East Malling Research station.

Plants of thirty seedling Strawberries raised by Mr. Boyes, Cambridge, recommended during 1933, have been established during the year for preliminary trial.

The year has been marked by unusually heavy crops carried by varieties of all kinds of fruit in the trials. Crops of Apples and Plums have been particularly heavy and have attracted considerable attention. Raspberries, Red and Black Currants and Gooseberries were all above average crops, despite the very dry summer. Among the "soft" fruit, no new variety was noted as of sufficient merit to warrant extended trial at the sub-stations.

Of Black Currants, the "standard" varieties 'Seabrook's Black' and 'Boskoop Giant,' have again cropped very heavily, and among the newer varieties cropping well were 'Invincible Giant Prolific,' 'Raven,' 'Supreme,' and 'Westwick Choice.'

Of Raspberries, the re-selected stock of 'Brocket Hall' cropped very heavily and produced an excellent sample of fruit. 'Red Cross,' 'Pyne's Royal' and 'Norfolk Giant' were other heavy cropping varieties. The variety 'Preussen' again behaved unsatisfactorily in growth and cropping.

None of the newer varieties of Gooseberry appears likely to prove superior to the well-known market varieties.

Among Strawberries, the new variety 'Western Queen' cropped satisfactorily (fruiting for the first time in the trials) and promised so

well as to justify the planting of additional trial beds during August. Other varieties of special note were 'Brenda' (Seedling No. 1), and 'Tardive de Leopold.' Efforts to identify the stock of 'Brenda' as a recognized American variety have not yet been successful. The stock of 'Oberschlesien,' despite careful re-selection, is not maintaining its previous vigour and cropping capacity in the last two dry seasons. The previous report that 'Gaddesden' is indistinguishable from 'Royal Sovereign' was confirmed.

Among the newer varieties of Plums, those of notable performance during the year were 'Early Laxton,' 'Laxton's Bountiful,' 'Laxton's Delicious,' 'Chivers' Cambridge Gage.' The variety 'Utility' cropped very heavily for the first time in ten years at Wisley. Of the older varieties in the collection 'Giant Prune,' 'Monarch,' 'Late Orange,' 'Comte d'Althann's Gage,' 'Bryanston Gage,' 'Grand Duke,' 'Diamond,' and 'President' cropped very heavily. The new varieties, 'Black Prince,' 'Stanleot,' 'Marjorie's Seedling,' and several unnamed seedlings, fruited for the first time in the trials. All varieties of Damsons cropped heavily, the 'Merryweather' proving the most satisfactory.

The two new Pears to crop freely were 'Laxton's Superb' and 'Beurré Bedford.' Pear 'Laxton's Superb' in season in September possesses qualities which may recommend it for commercial growing. 'Beurré Bedford,' an October Pear, has cropped very heavily, but further trial is necessary to determine whether it is any improvement upon existing commercial varieties of similar type and season.

Among newer Apples, those which this season attracted greatest attention by their cropping and appearance were :

Dessert.	Season.
'Laxton's Superb' *	November-February.
'Lord Lambourne' *	October.
'Millicent Barnes'	October-November.
'Laxton's Exquisite'	September.
'Laxton's Epicure'	September.
'Woolbrook Pippin'	November-January.
'Norfolk Challenger'	September-November.
'Thorpe's Peach'	October-December.
'Melba' *	August-September.

Culinary.	
'Sowman's Seedling'	July-August.
'Arthur Turner' *	July-September.
'Crawley Beauty' *	December-March.
'Cottenham Seedling'	December-February.
'Encore'	December-May.
'Edward VII'	December-April.
'Monarch' *	December-March.

* These varieties are already growing at the sub-stations.

Dual-Purpose.	Season.
'George Neal'	September–October.
'Opalescent'	November–February.
'Wagener'	January–April.
'Herring's Pippin' *	November–December.
'Woolbrook Russet'	November–May.
'A. W. Barnes'	October–December.

Of the Apples from Canada established in the trials, the variety 'Melba' again cropped very heavily and is creating great interest. It is a sweet Apple of good appearance, but very soft and easily bruised. Some of the newer varieties from Canada fruited for the first time and, so far as can be judged, there may be more promising material among them.

The normal spraying routine was carried out during the season. This consists of one spraying in December and January with tar distillate wash for all fruits. Most Apples and Pears are sprayed with lime-sulphur before and after flowering, but certain sulphur-shy varieties of Apple, as 'Cox's Orange Pippin' and 'St. Cecilia,' receive two applications of lime-sulphur before flowering and the post-blossom spraying is omitted. Plums are sprayed with lime-sulphur immediately after flowering, at 1–100 strength, against Red Spider, and the Black Currants with lime-sulphur, at 1–12 strength before flowering, against Big Bud.

There has been marked absence of any serious outbreak of disease or pest, the most troublesome being a late infestation of Woolly Aphis in the Nursery Grounds, and of Apple Scab on several of the new Apples from Canada.

Experimental work to determine the self-fertility or sterility of new varieties of Apples, Pears and Plums, and of Strawberries, has been continued in the field and in the Pollination Experimental House. Observations upon the susceptibility of new and old varieties of Apples and Pears to Scab disease have been made and of damage following lime-sulphur spraying.

At the R.H.S. Conference on Apples and Pears, held at the Crystal Palace in September, a paper was read by Sir Daniel Hall, F.R.S., entitled "The Fruit Trials at Wisley," and a paper on "New Varieties of Apples and Pears," based upon results obtained at Wisley and the sub-stations, was read by A. N. Rawes. These are printed in the Report of the Conference, pp. 121, 126. An exhibit of Apples under trial at Wisley and the sub-stations was staged at this Conference, and another exhibit of Apples and Pears recommended by the Society for private gardens.

There has been a rearrangement of sub-stations for trials of special fruits. The station established at the Kent Farm Institute, Borden, for Cherry Trials has been extended to include trial plots of Apples, Pears and Plums, and it is arranged that trials of Raspberries and

* This variety is already growing at the sub-stations.

Currants shall be carried out at the East Norfolk County Council Demonstration Plot at Burlingham and trials of Strawberries at the Botley Experimental Station, Hants. The final rearrangement of sub-stations is as follows :

Apples . .	Kent, Worcester, East Norfolk.
Pears . .	Kent, Worcester, East Norfolk.
Plums . .	Kent, Worcester, East Norfolk.
Cherries .	Kent.
Currants .	Worcester, East Norfolk, West Norfolk, Durham, Wisbech.
Gooseberries .	Worcester, East Norfolk, Durham, Wisbech.
Strawberries .	Worcester, East Norfolk, Durham, Wisbech, Hampshire, Cornwall.
Raspberries and other Berries	Worcester, East Norfolk, West Norfolk, Durham, Wisbech, Cornwall.

The Research Stations at Long Ashton and East Malling continue to receive varieties of *all* kinds of fruit recommended for extended trial, that are not already established at the stations, for demonstration purposes.

CANNING TESTS OF FRUIT GROWN IN THE COMMERCIAL FRUIT TRIALS AT WISLEY.

As reported in a previous account of the Trials of Commercial Fruits at Wisley (R.H.S. JOURNAL, 57, p. 270), arrangements are made for fruits of selected varieties of all "soft" fruits and Plums growing in the trial grounds at Wisley to be sent each season to the Fruit Preservation Research Station at Campden, Glos., to test their canning qualities. More than seventy varieties of different kinds of fruit have been sent to the Canning Station for testing. Certain of them, while satisfactory in growth and cropping capacity in the field have, when tested for canning, proved entirely unsuitable; a few others that have shown good canning qualities have disappointed in growth and cropping and cannot be considered the best for planting commercially. The results so far obtained may be briefly summarized as follows :

RASPBERRIES.—The varieties 'Lloyd George,' 'Pyne's Royal,' and 'Norfolk Giant' have proved the most satisfactory. Only moderately good results have been obtained with 'Red Cross,' although in certain areas this variety is largely grown for canning. 'The Ellis' has given consistently good results, but in growth and cropping the variety is not satisfactory.

Variety.	Year.	Remarks.	Conclusions.
Lloyd George	1931	Good colour, texture and flavour	Good
Pyne's Royal	1930	Very good colour; good flavour	Very good
"	1931	Quite good colour; good flavour	Good
"	1934	"	"

<i>Variety.</i>	<i>Year.</i>	<i>Remarks.</i>	<i>Conclusions.</i>
Norfolk Giant	1930	Bright; large; firm; good flavour	Quite good
Duke of Cornwall	1931 1930	" Pale; large; firm; quite good flavour	Good "
Red Cross	1931 1929	Pale, rather dull colour; ditto Moderate colour, shape and texture	Quite good Moderate
Rival	1930 1929	Rather poor; Rather dark colour; moderate flavour	Rather poor Moderate
Ellis	1930 1934 1929	" " Large; firm; very good colour and flavour	Rather poor Very good
"	1930	Large; firm; good colour and flavour	"
Brocket Hall	1931 1929	Very good colour and texture Soft when received	" Moderate
"	1930 1934	Rather pale; even; rather seedy	Quite good
Brocket Hall (A)	1934	Dull; rather seedy; good flavour	"
Reliance	1929	Pale; berries easily broken	Moderate
Reward	1929	Poor, pale colour;	Poor
"	1930	Pale; berries easily broken	Moderate
"	1934	Pale; small; weak flavour	Rather poor
Winkler's Seedling	1929	Soft when received; bright	Quite good
Epicure	1929	Dark, dull colour; rather soft	Moderate
"	1931	Dark; small	Quite good
Oswaco	1929	Rather pale; soft	"
"	1930	Pale; rather seedy; moderate flavour	Moderate
Bountiful	1929	Rather dark; firm	Good
"	1930	Quite good colour, texture and flavour	Quite good
Norwich Wonder	1929	Rather dark; firm	"
Helston	1929	Dull; poor shape	Rather poor
"	1930	Dull; seedy	"
Baumforth's Seedling (A)	1929	Very soft; bright; otherwise good	Quite good
Devon "	1930	"	"
Allenberry	1929 1930	Good, deep colour; firm Rather dull; firm	Good Quite good
"	1932	Rather pale; good flavour	"
"	1934	Dull; good shape and flavour	"
Reigate	1930	Good colour, shape and flavour	Good
Lynn's Superb	1930	Very pale; otherwise good	Quite good
"	1931	Pale; rather dull; moderate flavour	"
Prior's Prolific	1930	Pale; poor shape; "	Moderate
Laxton's Prolific	1930	Rather pale; quite good flavour	Quite good
Improved Beehive	1930	Deep red; firm; "	Good
Preussen	1934	Very pale; coarse drupelets; woody	Very poor
5/20 A	1931	Pale; rather soft; good flavour	Quite good
1/20 A	1931	Dull;	"
1/20 B	1931	Dull greyish tint; soft; scented flavour	Moderate
Lord Lambourne	1932	Poor, dull yellow; soft; good flavour	Poor

RED CURRANTS.—The varieties 'Raby Castle' and 'Laxton's Perfection' have been tested from other sources, but the two newer varieties, regarded as superior for general commercial planting, have given good results when canned.

<i>Variety.</i>	<i>Year.</i>	<i>Remarks.</i>	<i>Conclusions.</i>
Earliest of Fourlands	1931	Rather pale; tender; good flavour	Good

Variety.	Year.	Remarks.	Conclusions.
Laxton's No. 1	1931	Rather pale; tender; good flavour	Good

BLACK CURRANTS.—The standard varieties 'Baldwin,' 'Seabrook's Black,' and 'Boskoop Giant' have all given good results when canned, and of the newer varieties 'Davison's Eight' has proved entirely satisfactory.

Variety.	Year.	Remarks.	Conclusions.
Davison's Eight	1931	Good colour; tender; good flavour	Very good
Supreme	1931	Good colour; skins rather tough; acid	Moderate
Westwick Choice	1931	Good colour; skins rather tough; rather poor flavour	"
Laxton's Grape	1934	Good colour; bold; tender; good flavour	Very good
Wellington XXX	1934	Slightly pale; rather tough; poor flavour	Moderate
Raven	1934	Slightly pale; tender; good flavour	Quite good

GOOSEBERRIES.—'Careless' and 'Keepsake' are regarded as the best commercial varieties for canning.

Variety.	Year.	Remarks.	Conclusions.
Lancer	1932	Pale, oval, firm berry; quite good flavour	Good
"	1934	Pale, oval, well shouldered; firm and very good flavour	Very good
Emerald Gem	1932	Too green; rather tender flesh; moderate flavour	Moderate
Rearguard	1932	Pale; rather soft; quite good flavour	Quite good
Green Gem	1933	Too green; skins rather tough; moderate flavour	Moderate
Cousens' Seedling	1933	Good shape and colour; moderate flavour	Quite good
Whitesmith	1934	Good pale colour; plump shape; very good flavour	Good
Ingall's Seedling	1934	Good; very pale; fine appearance and quite good flavour	"
Whinham's Industry	1934	Rather too green; strong veins; moderate flavour	Moderate
Lancashire Lad	1934	" "	"

STRAWBERRIES.—Of the seventeen varieties tested for canning qualities several have given satisfactory results, but have proved entirely unsuitable for commercial planting as lacking in healthy vigour and cropping capacity. 'Royal Sovereign' and 'Sir Joseph Paxton' have given good results. First results with 'Brenda Gautrey' ('Huxley's Giant') were good, but with later samples the berries have been spoiled by a "mould," *Byssosclamyces fulva*.

Variety.	Year.	Remarks.	Conclusions.
Deutsch Evern	1931	Rather soft, long pointed, small berry; poor flavour	Moderate
Duke	1931	Good shape, firm; fair flavour	"
Shamlehurst Monarch	1931	Soft, uneven; poor flavour	Poor
Ettersberg 80	1933	Colour patchy; shape and flavour good	Moderate
Sir Joseph Paxton	1931	Very good colour and shape; good flavour	Good
Or du Rhin	1932	Good colour and shape; firm; good flavour	Quite good
Oberschlesien	1931	Colour and flavour good; uneven shape; rather soft	Moderate
Aberdeen Standard	1931	Good colour and shape; firm; rather poor flavour	Quite good

PLUMS.—'Victoria,' 'Rivers' Early Prolific,' and 'Purple Pershore' are regarded as good canning varieties. Of the newer plums 'Early Laxton' has proved excellent for canning.

<i>Variety.</i>	<i>Year.</i>	<i>Remarks.</i>	<i>Conclusions.</i>
Early Laxton	1931	Very good colour, texture and flavour	Very good
"	1934	Very good colour; small; quite good flavour	Good
Goldfinch	1934	Good colour; skins tough; weak flavour	Quite good
Cambridge Gage	1934	Rather poor colour; soft; mild gage flavour	Moderate
Sugar Plum	1934	Very poor greyish colour in pink syrup; tough	Very poor
Stanelot	1934	Very poor greenish colour in pink syrup; 'ough	"
Pacific	1934	Very poor greenish brown in pink syrup; tough	"

PLANTS TO WHICH AWARDS HAVE BEEN MADE.

Acacia dealbata. A.M. January 8, 1935. From Mrs. R. L. Newman, Dartmouth. The 'Mimosa' of the florists' shops is too well known to need description. Unfortunately it is too tender to succeed in the open in any but mild localities, but where happily established it produces its fragrant, yellow flowers in the greatest profusion.

Apple 'Winter King.' A.M. February 5, 1935. Raised by the late Mr. Wm. Pope about 1920 by crossing 'Cox's Orange Pippin' and 'Worcester Pearmain,' and sent by Messrs. Pope, Wokingham. Of medium size, conical, firm, sweet, of good flavour, almost entirely covered with deep red flush and stripes, flesh yellow; in season from December to April. The eye is half open in a round, even basin and the stalk short, often knobbed, in a shallow, narrow cavity. It is said to be of vigorous, upright habit of growth and a heavy cropper.

Calanthe × 'Warden' var. 'Ruby.' A.M. January 8, 1935. From Clive Cookson, Esq., Nether Warden, Hexham. ('Hexham Gem' × 'Angela.') Erect spikes of crimson-red flowers.

Carnation 'Allwood's Purity.' F.C.C. November 12, 1934. From Messrs. Allwood Bros., Hayward's Heath. Described R.H.S. JOURNAL, 59, p. 444 (A.M. May 29, 1934).

Carnation 'Ditchling.' F.C.C. November 12, 1934. From Messrs. Allwood Bros., Hayward's Heath. Described R.H.S. JOURNAL, 59, p. 354 (A.M. March 20, 1934).

Carnation 'Wivelsfield Crimson.' F.C.C. November 12, 1934. A vigorous, free-flowering variety with stiff erect stems and strong calyces; flowers 2½ inches diameter, crimson.

Cotoneaster lactea. A.M. February 5, 1935. From the Marquess of Headfort, Kells, Co. Meath. A large, spreading, evergreen shrub with long, arching growths amply furnished with dark green, rugose, elliptical leaves and clusters of small red berries on short lateral twigs. The late fruiting season makes this a very desirable plant. The specimen which received the A.M. in 1924 when exhibited as *C. lactea* was later identified with *C. serotina*, another handsome species which was awarded the F.C.C. in 1919.

Cymbidium × 'Claudette.' A.M. February 5, 1935. From Messrs. McBean, Cooksbridge. *C. × Coningsbyanum* × *C. × 'Miranda.'* Sepals and petals greenish yellow, the large labellum of lighter colour and spotted with red-brown.

Cymbidium × 'Cresta.' A.M. February 5, 1935. From Lionel de Rothschild, Esq., Exbury, Southampton. *C. grandiflorum* × *C. × 'Flamingo.'* Arching spike of eight white flowers, the labellum spotted with crimson and having a light yellow crest.

Odontioda × '**Dacia**' var. '**Solario**.' A.M. January 8, 1935. From N. Prinsep, Esq., The Boxes, Pevensey. Flowers well formed, crimson-scarlet, with rose margin.

Odontoglossum × '**Yolandum**' var. '**Princess**.' A.M. January 8, 1935. From Messrs, Charlesworth, Haywards Heath. ('Princess Yolande' × *crispum*.) Spike of fourteen flowers, white, with reddish blotching.

Prunus campanulata. A.M. January 8, 1935. From the Director, Royal Botanic Gardens, Kew. A very beautiful Cherry requiring greenhouse protection. The deep, rosy-pink, campanulate flowers are arranged in long-stalked three- to four-flowered bunches produced on short lateral spurs. The elliptical-lanceolate, finely-toothed leaves are dark green, about 5 inches long. Native of Japan and Formosa.

Rhododendron '**Blue Peter**.' A.M. June 7, 1933, after trial at Exbury. Flowers pale lavender blue with a deep blotch.

Rhododendron '**Dairymaid**.' A.M. April 28, 1934, after trial at Exbury. A *campylocarpum* hybrid of compact habit, leaves dark green, 5-6 inches long, 1½-2 inches wide; flowers lemon-yellow tinged pink, with a pink blotch; truss compact.

Rhododendron '**Earl of Athlone**.' F.C.C. June 7, 1933, after trial at Exbury. Flowers bright blood red.

Rhododendron '**Edith Mackworth Praed**.' A.M. May 14, 1934, after trial at Exbury. Bush upright and open, foliage dark green, oblong-lanceolate, 6-7 inches long, 3 inches wide, truss rather loose, of 14-16 flowers. Flowers bright crimson.

Rhododendron '**Hugh Koster**.' A.M. June 7, 1933, after trial at Exbury. Flowers bright crimson.

Rhododendron '**Lady Bligh**.' A.M. May 14, 1934, after trial at Exbury. Bush of moderately compact habit, leaves 4-5 inches long, 2 inches wide, dark green, trusses compact, of 12-15 flowers. Flowers strawberry red, corolla rather flat, 3 inches wide.

Rhododendron '**Lady Primrose**.' A.M. June 7, 1933, after trial at Exbury. Flowers lemon-yellow.

Rhododendron '**Lady Stuart of Wortley**.' A.M. June 7, 1933, after trial at Exbury. Flowers pink.

Rhododendron '**Madame F. J. Chauvin**.' A.M. June 7, 1933, after trial at Exbury. Flowers rosy-pink, with a paler centre and deep blotch.

Rhododendron '**Mrs. A. M. Williams**.' A.M. June 7, 1933, after trial at Exbury. Flowers red.

Rhododendron '**Mrs. Charles Pearson**.' A.M. June 7, 1933, after trial at Exbury. Flowers bluish-mauve, spotted burnt sienna.

Rhododendron '**Mrs. G. W. Leak**.' F.C.C. May 14, 1934, after trial at Exbury. Bush of upright open habit, leaves dark green, about 6 inches long, oblong-lanceolate, truss large, compact, of 16 to 18 flowers. Flowers pink with a prominent brown-purple blotch.

Rhododendron 'Mrs. Furnival.' A.M. June 7, 1933, after trial at Exbury. Flowers light pink with sienna blotch.

Rhododendron 'Mrs. Lindsay Smith.' A.M. June 7, 1933, after trial at Exbury. Flowers white.

Rhododendron 'Mrs. Philip Martineau.' A.M. June 7, 1933, after trial at Exbury. Flowers rose-pink, fading to a lighter shade, with a pale yellow blotch.

Rhododendron mucronulatum roseum. A.M. January 8, 1935. From the Director, Royal Botanic Gardens, Kew. *Rhododendron mucronulatum* is a small, deciduous shrub from Manchuria and Corea with elliptic or oblong slightly crenulate leaves and widely expanded mauve-pink flowers clustered at the tips of its branchlets, produced before the leaves. In the present variety the flowers are of an attractive bright rose colour.

Rhododendron 'Nanette.' A.M. June 7, 1933, after trial at Exbury. Flowers blush-pink with a dark blotch.

Rhododendron 'Princess Elizabeth.' A.M. June 7, 1933, after trial at Exbury. Flowers deep crimson.

Rhododendron 'Pygmalion.' A.M. June 7, 1933, after trial at Exbury. Flowers deep crimson scarlet, black and spotted, in a large well-built truss.

Rhododendron 'Rosamund Millais.' A.M. June 7, 1933, after trial at Exbury. Flowers cerise, blotch burnt umber.

Rhododendron 'Unique.' A.M. April 28, 1934, after trial at Exbury. A *campylocarpum* hybrid of compact habit, leaves 2-2½ inches long, 1½-2 inches broad, dark green. Flowers pale yellow flushed pink, pink in bud.

Rhododendron 'Valewood Pink.' A.M. May 14, 1934, after trial at Exbury. Bush compact, leaves light green, 4-5 inches long, trusses open, of 9-10 flowers on pedicels 1½-2 inches long. Flowers shell-pink with deeper tinted margins.

Sophrolaeliocattleya × 'Phena' var. 'Saturn.' F.C.C. January 8, 1935. From Messrs. McBean, Cooksbridge. (*S.-l.-c.* × 'Rainbow' × *S.-l.-c.* × 'Meuse'). Flower of medium size, and rich ruby-crimson in all the segments.

GARDEN NOTES.

Brassia brachiata is probably the largest flowered of the family, as though the segments of *B. Lawrenceana* and its variety *longissima* are considerably longer, they have not the breadth and strength of the corresponding segments in *B. brachiata*. In that species the span between the tips of the upper and lower sepals often exceeds 10 inches, and though attenuated in the manner characteristic to Brassias their width is more apparent than usual.

The colouring is similar to that of the better known *B. verrucosa*—light yellowish-green, thickly maculated with dark almost black sepia on the basal portions of the sepals and petals. The latter are inclined upward with the dorsal sepal, but do not attain the length of that segment, which exceeds 4 inches. The lower sepals, over 6 inches long, are at first parallel to each other, then diverge; their spotted portions are almost hidden by the lip, on which the yellow colouring is more decided, the spotting being dark green rather than brown, and slightly verrucose, but not as pronouncedly wart-like as in *B. verrucosa*. The blade of the lip is broadly heart-shaped, $1\frac{1}{2}$ inch in lateral diameter, with a central ligular reflexed extension; the basal portion of the labellum has its sides strongly reflexed. The crest consists of two thick lamellæ, white, marked with orange-yellow.

Seven to nine flowers are borne on stout ascending scapes, and imposed over the dark green di-triphyllous pseudobulbs are decidedly attractive, the more so as the flowers usually face in different directions.

A native of Guatemala, where it was discovered in 1839, the species should be grown in a cool house, *i.e.* one in which natural heat induces a subtropical temperature in summer but may fall to 50° F., occasionally lower, in winter. Compost should be *repaired* as required; re-potting should be avoided until absolutely necessary. Let the newer growths extend over the pot or pan rim for a year.—*E. Cooper*.

Rose Pruning.—Pruners of dwarf roses can be divided into two groups, namely, those who claim that the so-called dwarf roses should be pruned almost to the ground each season, and those on the other hand who prune very lightly. Without being dogmatic as to the correct method, I will briefly give our experience of the light pruning method practised in the garden at Trent Park. The treatment the first season after planting is to prune back severely, the following and subsequent seasons pruning is very light, the aim being to increase the stature until a fair-sized bush is obtained. Under this treatment it might be expected that the bushes would tend to produce top growth only, but such is not the case; the bushes seem so happy that frequently strong basal shoots are produced even on wood several seasons old.

The bushes in a large border of the variety 'Red Letter Day,' planted in this garden about twelve years ago, now stand 6 feet high and many are 3 feet through at the time of writing (January), and the average height when pruned in mid-March will be about 4 feet.

The effect when in flower is a glorious display, and when not flowering they present a mass of luxuriant growth good to look upon. The soil in the border is almost hidden, a contrast to beds one often sees where hard pruning has been practised. Although many of the varieties grown here belong to the old Hybrid Perpetual group, we have many Hybrid Teas under this treatment.

'Dainty Bess' (fig. 27) does exceptionally well here light pruned. Our bushes planted in 1929 have attained an average height of 6 feet and present a glorious bank of flower during most of the summer. In another part of the garden the varieties 'Ophelia,' 'Caroline Testout,' 'Lady Hillingdon,' 'Betty Uprichard,' 'Mrs. John Laing,' 'Hugh Dickson' and 'Captain Hayward' are all happy lightly pruned.

Although I do not claim that this treatment would be successful with all varieties in every garden it can be thoroughly recommended by way of a trial.

When one realizes that a rose is a shrub and not a herbaceous plant to be cut down to the ground each year, it will be seen that there is some reasonable argument in favour of this treatment. The method is strongly advocated where roses are grown for garden decoration.

Roses grown in this way will not fit into a scheme of small beds, they must be grown in bold masses or even better still in a border.

J. Wilson.

Stapelia nobilis.—The genus *Stapelia* comprises some 70 or 80 species of cactus-like plants (belonging, however, to the natural order Asclepiadaceae), the majority of which are found in South Africa, with three or four species in tropical Africa. They have curiously formed flowers, with various coloured markings. Stapelias are usually regarded as not very amenable to cultivation owing to their liability to damping at the stem base, near the soil, especially in the winter time. Having had some measure of success with *S. nobilis*, one of the largest flowered of the genus, the editor has asked for a note on its cultivation.

All Stapelias must have good drainage and an open sandy soil in which to grow, and the stems must not be planted too deep. Like most succulents they are easily propagated by seeds if obtainable, or by cuttings made from the stems which must not be given too much water until roots have formed. When well rooted they require a fair amount of water during the growing season, and during this time the roots must never become so dry that the stems shrivel, such a condition often proving fatal.

All Stapelias are best when grown in a slightly higher temperature than most Cacti, and *S. nobilis* with its near allies, *S. gigantea*,

S. grandiflora, and *S. hirsuta* require a summer temperature of 70° to 75°, and a winter temperature of 60° to 65°. An atmosphere reasonably charged with moisture is also essential to their well-being as this allows of their being kept rather drier at the root, especially in their resting period, without the danger of the stems shrivelling.

A two-year-old plant of *S. nobilis* grown in this way has this autumn produced twelve flowers, 5 inches to 6 inches across.

Wm. Hales.

BOOK REVIEWS.

"Shrubs for the Rock Garden." By F. Stoker, F.L.S., M.B. 8vo. 64 pp. (The Alpine Garden Society, by Williams & Norgate, London, 1934.) 3s. 6d.

Almost all garden lovers are eager collectors of books dealing with gardening, and many of us reserve an easily reached shelf or two for our favourite books.

This book merits, and will surely find, a place of honour on such a shelf. Perhaps it will be between Bean's "Trees and Shrubs" and Hornibrook's "Dwarf Conifers," or alongside Farrer's great work, "The English Rock Garden." It will not be misplaced among such distinguished companions.

The importance of shrubs that are suitable for rock gardens has not yet been fully realized. The late Mr. George Paul remarked that a well-placed shrub that would retain its characteristic form and compact growth into old age provided a pleasant contrast to out-cropping blocks of stone, especially in the upper portions of the mounds or at a corner of a path.

Too often it happens that juvenile specimens of large trees are used for this purpose, such as a seedling Pine, Spruce or Yew, and unless they can be treated in Japanese fashion as to shearing they will in unchecked adolescence become a nuisance.

Here then is a book resulting from personal experience, written in a charmingly simple and conversational style, which sparkles with natural wit and apt combinations of words.

One plant has a "shaky reputation for hardiness"; of another we learn that its rarity, rather than its face, is its fortune; and when we are told that *Juniperus Sabina* var. *lamariscifolia* is "a flat-topped thoroughly 'meaty' evergreen . . . and a great spreader," how clearly we see the position it is suited for.

The twenty beautiful illustrations are all from photographs taken in the author's garden.

It seems that the only chance of a grumble arises from a failure in old-fashioned minds to appreciate the novelty of the placing of a charming picture in one corner of a page so that at the top and on one side it has no margin, and looks as though cut out from a larger illustration and to have slipped, before it was dry, when gummed on to its nice white mount.

The lime-free soil of the author's garden is a key to his success with so many rare plants, a key which, as he says, is not in everybody's pocket; but the alphabetical list of tiny shrubs he provides contains many that can be grown anywhere, and as he has proved, will not outgrow their "pig beauty"—as an Irishman defined a youthful charm—to become gaunt hobbledohs and destroy the effect of well-proportioned contrast they were planted to provide.

"Flower Decoration." By Constance Spry. 8vo. (J. Dent, London, 1934.) 12s. 6d.

A beauty specialist in the world of flowers, Mrs. Constance Spry is unique in the lavish way in which she gives away secrets in her book, "Flower Decoration."

The author has a genuinely enthusiastic quality which is apt to carry her away, so that at times she tends to become more poetic than practical. To cite one instance—it would be a remarkably stoical bride who could arrive at the chancel steps without wilting beneath the weight of the hand spray of nearly two dozen arum lilies illustrated on page 145.

This book will commend itself both to those who grow and those who buy flowers, for it not only suggests the best kinds to grow for house decoration but also how to arrange them.

Mrs. Spry achieves her effects with unflagging originality. She can take rhubarb and spurge and put them in a pottery vase, or a bundle of stripped elderberry and coax it into a fantastic tracery reminiscent of an Arthur Rackham illustration to Grimm's fairy stories. What is more, she is a clever journalist and her experiments make excellent reading, even for those too ignorant to recognize some of the flowers of which she writes. That the illustrations to the book are attractive goes without saying since they show Mrs. Spry's own arrangements.

K. FURNISS.

"Leaflets on Insect Pests of Farm and Garden Crops." Ministry of Agriculture. 8vo. (H.M. Stationery Office, London, 1933.) 1s. 6d. net.

This is a portfolio of leaflets issued by the Ministry of Agriculture dealing with farm and garden insect pests. It is to replace the sectional volume 10 and is arranged so that any leaflet may be withdrawn and a revised edition inserted at need.

It is unnecessary to discuss the quality of the contents of these leaflets for that is well known, but attention may be drawn to the wide range covered by the contents of the portfolio, for in addition to the leaflets dealing with the more common pests, others relate to the rhododendron bug, to the narcissus flies, the greenhouse white fly, the greenhouse red spider, and so on.

The whole forms a very valuable and convenient book to have at hand for all who cultivate plants.

"Edible and Poisonous Fungi." Bull. 23. Ministry of Agriculture. Ed. 4. 8vo. v + 25 pp. (H.M. Stationery Office, London, 1934.) 3s. 6d. net. Paper boards.

A new edition of this extremely useful little book with very well-reproduced plates of common fungi, both edible and poisonous, in colours, with brief descriptions and marks by which the edible can be distinguished from somewhat similar poisonous species.

"Dictionary of Terms relating to Agriculture, Horticulture, Forestry, Cattle Breeding, Dairy Industry and Agriculture, in English, French, German and Dutch." Compiled by T. J. Bezemer. 8vo. vii + 251 + 294 + 267 + 249 pp. (Allen & Unwin, London, 1934.) 25s.

As indicated in the title this useful dictionary gives the equivalents in four languages of the technical terms used in horticulture and the other rural industries mentioned. It is arranged in four sections the first of which gives the English term followed by its synonyms in the three other languages; thus—

perennial.—*Staudef.*—*vaste plant f.*, *overblijvende plant.*—*plante f. vivace.*
 perianth.—*Blütendecke f.*, *Blutenhülle f.*—*bloembekleedsel n.*, *bloemdek n.*—
périanthe m., *enveloppe f. florale.*

The second part similarly starts with the German forms of the term giving the Dutch, French and English after it, thus—

Staudef., *mehrfähriges Kulturgewächs n.*—*overblijvende plant f.*, *vaste plant*, *overjarig (meerjarig) gewas, n.*—*plante f. vivace*, *végétal m. vivace.*—
perennial.

The third part starts with the Dutch terms, the fourth with the French.

The book should prove very useful to horticulturists who have occasion to know the foreign equivalent of terms in general use.

"A Handbook of Narcissus." By E. A. Bowles, F.L.S., F.R.E.S., V.M.H. 8vo. 248 pp. (Hopkinson, London, 1934.) 12s. 6d. net.

Some books are written honestly; others are more or less successful imitations of those which have gone before. Some are constructed, sentence by sentence, chapter by chapter; others represent an untidy heap of words so jumbled that to extract their collective meaning involves a labour which displaces any pleasure or instruction they are presumably intended to convey.

The present volume is written in lucid English with an ease indicative of perfect familiarity with the subject. Comprising a concise yet detailed survey of Narcissus, avoiding technicalities without neglecting their significance, it is as essential to the expert as it is indispensable to the tyro.

A useful glossary of botanical terms is followed by a history of the generic name. The next 22 pages are devoted to Narcissus anatomy and physiology, as important a section, in the reviewer's opinion, as any in the book. It is evident that Mr. Bowles has no belief in the tenets of the "Gardening by the Fireside" school. He requires the reader both to observe the plant *in vivo* and to dissect it.

A description of species and hybrids, classified according to the R.H.S. system, occupies the bulk of the work. These are given with admirable conciseness without, however, losing value. It is no easy task to maintain a reader's interest in a monograph; its usual lot is that of being kept for reference. The author surmounts the difficulty by unobtrusively inserting into the text his personal recollections, tales of the triumphs, ventures, and misadventures of

Narcissus pioneers, and generous appreciations of the work done by present-day colleagues.

More and more is it becoming generally realized that knowledge is to be found in the record of its own evolution. Though Mr. Bowles does not proclaim this theory, that he believes in its truth is obvious from his attention to the history not only of the plants themselves but to that of the books concerning them. He foresees, though, that Narcissus lore may not appeal to a section of his readers, and, in the preface, advises them to "skip it." The skipping, if any such there be, will, we can assure him, be only temporary. It is only after following the craft some years that books bearing such embracing titles as "The Science and Art of Gardening" cease to satisfy and to instruct. We look about us and, if fortunate, discover the real literature of horticulture, to a section of which "Narcissus" not only points the path but is itself attached.

The chapter on cultivation is clear and practical. There is a timely reference to the importance of handling bulbs gently, and dangers which follow what may be spoken of as greengrocers' technique are pointed out with warning pen. Then the use of Narcissi in the border, their value as associates for shrubs, their arrangement in the grass of park or meadow are dwelt upon with artistry, while the author's advice on how to make the most of cut flowers will not fall on stony ground.

The publishers are to be congratulated on the very attractive 'get-up' of the book, and upon the reproductions of Mr. Bowles' drawings. We have detected only one misprint, it occurs on p. 30, second line from bottom; the sentence is made to read "the outer whorl of flower leaves, the sepals, closely resemble the inner world,* the petals." A pretty conceit, even if not intended by the author!

F. STOKER.

"Garden Design of To-day." By Percy S. Cane. Fcp. 4to. xv + 222 pp. (Methuen, London, 1934.)

In this book the author gives an outline of the elementary laws of design and goes on to explain what treatment would, in his opinion, be most suitable for various kinds of large and small town or country gardens.

There is one brief chapter on gardens for modern houses which in view of the title of the book might well have been dealt with at greater length. Perhaps the most interesting sections are those concerning glade planting, wild gardens and woods, which are full of practical suggestions for the planting most suitable under the particular circumstances.

The volume is illustrated with over fifty well reproduced plates of garden photographs, together with a number of line drawings by Harold White, which add considerably to its attraction and interest.

The statement on p. 308 that gold and silver yew, box and hollies are hybrids is not quite an accurate presentation of the facts.

"Gardening in Stone." By Edith G. Wheelwright. Preface by Eleanor Sinclair Rohde. Demy 8vo. 193 pp. (Williams & Norgate, London, 1934.) 5s. net.

This book aims at being "a short practical guide for the many gardeners who in a limited space are growing rock plants in walls, troughs and paving stones, and who are anxious to grow them well." It gives practical advice as to the construction of dry walls and stone paths, as well as lists of plants for growing in different aspects and soils.

Several spelling mistakes are to be found among the names of the plants. "Lithospermum," for example, occurs with irritating frequency, and this detracts from what is otherwise an excellent little book.

It includes eight garden photographs and several small sketches of rock plants.

"The Families of Flowering Plants, II. Monocotyledons. Arranged according to a new system based on their probable phylogeny." By J. Hutchinson, F.L.S. 8vo. xiii + 243 pp., with 107 figs. (Macmillan, London, 1934.) 20s.

This volume completes the presentation of Dr. Hutchinson's views on the systematics of the Flowering Plants based on their phylogeny. The volume dealing with the Dicotyledons appeared in 1926. The author gives a sketch of the systems adopted by Bentham and Hooker in their classic "Genera Plantarum" and of that adopted in the "Pflanzenfamilien" of Engler and Prantl.

Neither Bentham nor Hooker would have claimed that their system was based on phylogeny: it was, so to say, prephylogenetic and should not be criticized from that point of view. Engler, who has elaborated his system in the various editions of the "Syllabus," is definitely phylogenetic, but his standpoint differs fundamentally from the newer one of which the present is a development. Engler postulates independent lines of Angiosperms, both Monocotyledons and Dicotyledons arising from a group of Protangiosperms existing in the Mesozoic, and regards the Pandanales as the nearest approach to the Protangiosperms among existing Angiosperms. Dr. Hutchinson continues the line adopted in his first volume on the view that Angiosperms are monophyletic and find their origin in the Ranales.

Two distinct views have been advanced as to the origin of the Monocotyledons from the Dicotyledons: are they monophyletic or diphyletic? Lotsy, following Hallier, derived the Spadicifloral group of Monocotyledons (Araceae, Palmaceae, Pandanaceae, etc.) from the Piperales in the Dicotyledons, and the remaining groups from a hypothetical group, Proranales. Dr. Hutchinson believes that all the groups have sprung from the Ranales, and regards any resemblances with the Piperales as examples of parallel development. There is obviously room for a difference of opinion as to a distinction between phylogeny and parallel development. Dr. Hutchinson's plea for the importance of endosperm, which is so generally abundant in the Monocotyledons, as indicating an origin from the Ranales, where it is also abundant, is somewhat damaged by its absence from the two orders which he regards as the most primitive—Butomales and Alismatales, where it has presumably been lost as the result of adaptation to an aquatic habitat. He is also not quite clear on the morphology of the endosperm in the Angiosperms.

Botanists will however welcome Dr. Hutchinson's presentation, evidently the result of a careful study of the families, as supplying new and interesting points of view. Of special interest is his division of the Class into two series, based on the character of the perianth. In the group which is regarded as the most ancient there is, in addition to an apocarpous gynoecium, a biseriata perianth, namely, an outer whorl of free, often green sepals, and an inner of free, coloured petals. This, which is termed *Calyciferae*, starts with the Butomaceae and Alismataceae and persists through the Commelinales and Bromeliales ending in the Zingiberales, which are regarded as a parallel development to the Orchidaceae; the aquatic orders are a reduced offset of this, beginning with the Juncaginales and culminating in the Najadales. The remaining groups are a development from the Liliales, and represent mainly terrestrial or epiphytic groups. These form a series, *Corolliferae*, "petaloid Monocotyledons," in which the two whorls of the perianth combine to form a corolla. Perhaps one of the least convincing suggestions is the derivation of the Aroids from the Liliaceous stock through an *Aspidistra*-like ancestor, the only argument in favour of which would seem to be the densely spicate inflorescence of the Aspidistreae.

Few systematists will object to the breaking up of the Liliaceae as understood by Bentham and Hooker or Engler, and the recognition of some of the sub-families as distinct families. This is in part a return to earlier conceptions. But Dr. Hutchinson goes much further, and by subordinating the character derived from the relative position of the ovary to that derived from the inflorescence he alters considerably our previous conception of Liliaceae and Amaryllidaceae. The most distinctive feature of the latter is the umbellate, scapose inflorescence, and using this as a criterion, the *Agapantheae*, *Allieae* and *Gillesieae*, all with a superior ovary, are transferred to the Amaryllidaceae. Even with this reduction, and after the removal of the Dracaeneae, Trilliaceae, Smilacaceae, and Ruscaceae, the Liliaceae is a large and varied family, the classification of which, as the author suggests, demands more intensive monographic study.

The general arrangement of the text is similar to that of the previous volume. A useful innovation is the introduction of keys to the tribes and genera in each family. For that to the Hydrocharitaceae the author is indebted to Mr. J. E. Dandy of the Department of Botany, British Museum. The illustrations, by the author, are a notable feature, clear, helpful figures. The small maps illustrating the distribution of some of the families are also useful. Dr. Hutchinson is to be congratulated on the completion of his work.

A. B. RENDLE.

"Modern Flower Growing for Profit." By W. E. Shewell-Cooper, N.D.H., F.L.S. 8vo. 195 pp. (Benn, London, 1934.) 5s.

Here is a book written by a painstaking author who has considerable knowledge of his business, upon which he must have spent much time, practical work and study.

Flower growing is an industry in every civilized country, but it is greater in England than anywhere, employing thousands of people, for in modern life flowers are almost a necessity.

The essential information for successful commercial flower production is clearly and precisely given. It should help the inexperienced who wish to venture upon commercial flower growing, and indeed most of those in charge of large private gardens would benefit considerably in their economical management with this book. It is the best book upon commercial flower growing out of doors that I have read.

The author considers the cost of anything he recommends. Complete success is the only way to conduct a profitable flower farm; partial success can only be less disastrous than failure. This book shows the reader how essential it is to have a high ideal, and to do everything in a thorough and orderly way.

He realizes, as few commercial people do, that certain districts are particularly favourable for certain specified subjects; this is all-important for the economical production of these crops. The need for standardization of everything used in commercial flower production is fully realized; it pays all those who are commercially minded, and others, to read books like this and make their own deductions. Success in horticulture is never made in a hurry.

I have particular pleasure, when reading any book upon branches of horticulture which I understand, in being critical and doubting the statements made. That was my attitude when I devoured "Modern Flower Growing for Profit," but a book of 195 compact pages cannot pretend to exhaust all this vast subject, even when flower growing under glass is omitted. If one wishes to be very critical it is easy to disagree with odd facts, such as with regard to wood ashes (p. 25); their actual value is not their low percentage of potash in comparison with sulphate of potash, but the fact that they have a certain mechanical action in the soil and are a real necessity for certain plants.

Naturally I was disappointed that Carnations and *Dianthus* generally were almost ignored. The dyeing of flowers (Chapter XVII) is a possible business which most of us disagree with and it can only appeal to a low class of trade, but the author deals with facts as they are.

Chapter XVIII on Sterilization and Chapters XIX and XX on Pests and Diseases were exceptionally practical. Chapter XXII, Marketing, is the essence of honest dealing and good business; grading, bunching, packing, labelling, and the whole system are dealt with in detail, including the honourable working with the salesman which is so essential.

M. C. ALLWOOD.

"Scots Gardens in Old Times, 1200-1800." By Elizabeth S. Haldane. 8vo. xii + 244 pp. (Maclehose, London, 1934.) 6s.

This eminently readable book deals with the period from 1200 to 1800, and includes chapters on Scots Gardens in the Days of the Monks and the Castles, the Physick Gardens of Scotland, Gardens in Scotland in the Seventeenth and Eighteenth Centuries, chapters on the Gardens of the People and the Scots Gardener. The authoress passes in review the social conditions during the various periods dealt with, showing that in these earlier and unsettled days such cultivation of plants as was then to be found was usually fostered and practised by the inmates of the numerous religious establishments then in existence.

Records, unfortunately, are incomplete or lacking altogether, but such records as exist from various writers and visitors to the country indicate the possibilities of the more favoured parts of the country and show that progress was largely hindered by the lack of any security of land tenure.

It is interesting to note the frequent references to such favoured parts as Moray, which was likened to "a second Lombardy or pleasant meadow of the North," also the Carse of Gowrie, Clydeside, the Lothians, etc., then, as now, the most favoured parts of Scotland.

The book, which is well printed on good paper, includes nine illustrations, including three in colour. One of historical interest shows the summer house in the Regent Moray's garden where assent to the union between Scotland and England was signed.

J. COURTIS.

NOTES AND ABSTRACTS.

Agathosma perdit. By J. Hutchinson (*Bot. Mag.*, t. 9377; Oct. 1934).—A small shrub, native of S. Africa, with densely leafy branches, leaves loosely pubescent, flowers in terminal clusters, small, pink. Plant scented.—F. J. C.

Apple Sawfly, The Control of the. By H. G. H. Kearns (*Herefordshire C.C. Agric. Qrty. Jour.*, March 1934, 6 pp.).—The life history of the pest is described in brief.

The determination of dates for spraying is given—one of the most serious difficulties that has arisen in the successful control of the Sawfly is that the critical spray period coincides with that of other washes, more especially lime-sulphur applied for the control of Scab and Red Spider.

Four methods, three for double applications and one for single application, are given to provide control of pests other than Sawfly and Scab.

The points to be observed in spraying are explained.—G. F. W.

Apple Sawfly (*Hoplocampa testudinea* Klug.), Experiments on the Control of the. By G. L. Hey and W. Steer (*Ann. Rept. East Malling Res. Stat.*, 1933, pp. 197–216).—The chief object of the investigation was to ascertain the degree of control obtainable with certain sprays, and to discover the vulnerability of the pest at various stages in its development.

The information obtained shows the relative value of directing control measures against: (i) the adult by means of Derris; (ii) the eggs by means of nicotine; (iii) the young larvæ by means of (a) petal-fall applications of Derris, barium silicofluoride and lead arsenate, and (b) post-petal fall applications of Derris, barium silicofluoride, lead arsenate and nicotine; and (iv) the migrating larvæ by means of Derris and nicotine.

The results obtained in field trials in which various dusts and sprays were applied to several varieties of Apples are explained in detail.

The conclusions drawn as to the susceptibility of the several stages of the pest to the various sprays tested show that: (i) the adult is susceptible to Derris dust; (ii) the egg is susceptible to nicotine and soap; (iii) the newly hatched larva appears to be equally susceptible to nicotine-soap and to Derris-soap; and (iv) the migrating larva-secondary infestation of the fruit was arrested by a Derris dust, by Derris-soap, and by nicotine-soap, each applied eighteen days after petal-fall.

The performance of certain wetters and spreaders is briefly described.

G. F. W.

Apple Sawfly (*Hoplocampa testudinea* Klug.) in 1933, Miscellaneous Observations on the. By G. L. Hey and W. Steer (*Ann. Rept. East Malling Res. Stat.*, 1933, pp. 234–242).—Observations which were made whilst carrying out field trials on the control of the Apple Sawfly included the study of: (i) the Larval Instars; (ii) Migration of the Larvæ; (iii) Depth of Pupation; and (iv) Varietal Susceptibility.

Circumstantial evidence was obtained which indicated an extra (sixth) instar in larvæ which become females.

Larval migration and secondary attack on fruits was found to occur at an earlier stage of larval development than has formerly been supposed. The migrating larvæ were controlled to varying degrees by applications of a Derris dust, nicotine-soap wash, and Derris and soap.

The cocoons were constructed chiefly in the top four inches of soil.

Mid-season varieties of Apple were found to be more susceptible to attack than early-flowering varieties, but not much more susceptible than late varieties.

G. F. W.

Apple Sawfly—Some Suggestions for Control Measures. By G. L. Hey, M. H. Moore and W. Steer (*Ann. Rept. East Malling Res. Stat.*, 1933, p. 258).—The following suggestions are made as a result of experiments carried out in 1933: (i) to spray with nicotine (8 oz. to 100 gallons of lime-sulphur spray) at any time from petal-fall (i.e. when about 80 per cent. of the petals have fallen) to

about a week afterwards. The addition of a suitable wetter and spreader (not soap) is desirable, and the trees to be forcibly sprayed.

A reduction in the strength of the lime-sulphur from 1 gallon to 6 pints to 100 gallons is necessary to prevent injury in certain varieties of apple.

Many sulphur-shy varieties do not require any post-blossom treatment for Scab, and may be sprayed with nicotine and soft soap (8 lb. to 100 gallons), except in the case of trees which have already been sprayed at pink-bud stage with lead arsenate, in which case an alternative spreader is advisable.

The petal-fall application for Sawfly is intended to kill the eggs of the Sawfly and so to prevent infestation of the fruits.

If this spray is omitted, it is desirable to apply a Derris dust immediately tunnels are found beneath the skin or holes in the side of the fruitlets to protect the remaining uninjured fruits. A further application of dust is necessary if the first is washed off by rain within ten days of the application.—G. F. W.

Aquilegias. By H. S. Boothman (*Gard. Chron.*, vol. xcv, 1934. Third Series, pp. 12, 29, 281, 351, 408).

A carefully compiled list of the species and varieties arranged in alphabetical order. Each is fully described in simple language and is referred to one of eight groups arranged thus: 1. *Vulgaris* Group. 2. Alpine, with *A. alpina* as type. 3. Himalayan. 4. Japanese. 5. *Bulbistyla*, the Canadian development of *A. vulgaris*. 6. *Coerulea*, of Rocky Mountains. 7. *Formosa*, with pendent flowers, sepals red or yellow. 8. *Chrysantha* with yellow erect flowers. The alphabetical arrangement may entail some difficulty in tracking down a specimen when its name is unknown to the enquirer, and a list of species arranged under their group name would make this good piece of work even more useful.—E. A. B.

Arctostaphylos, Revision of Genera formerly included in. By Alice Eastwood (*Leaf. West. Bot.*, I. no. 10, pp. 97-100; May 1934).—*Arctous*, *Comarostaphylis*, *Xylococcus* and *Schizococcus* are considered genera distinct from *Arctostaphylos* in fruit characters and habit.—W. T. S.

Arctostaphylos, A Revision of the Californian Species. By Alice Eastwood (*Leaf. West. Bot.*, I. no. 11, pp. 105-127; Aug. 1934).—This paper describes the species of *Arctostaphylos* native to California, a few from Oregon being also included. The authoress recognizes 52 species, in contrast to the pair, *A. tomentosa* and *A. nummularia*, attributed to the region when she first began to discriminate them many years ago. The group consists of the shrubs commonly known as Manzanitas, which form a great part of the Californian chaparral. The flowers are small, urn-shaped, rose-tinged or clear rose-colour, in racemes or more generally panicles terminating branches. They bloom in winter or early spring in the coastal regions and, soon after the snow melts, at greater elevations. The berries of some are made into cider by the Indians. The species vary in their reaction to fires, some being killed outright, but reproducing abundantly by seeds—a seedling is rarely found until after a fire—while others sprout from underground stems. The habit and height of the shrubs, the form and colour of the leaves, pale green, bright green or glaucous, the size and colour of the flowers, the hair-covering of the stems, inflorescence and ovary, the size of fruit, etc., are used to distinguish them. A key based on obvious characters is provided. Four of the 52 species are new.—W. T. S.

Azara lanceolata. By A. D. Cotton (*Bot. Mag.*, t. 9374; Oct. 1934).—An evergreen probably rather tender tree from S. Chile with lanceolate bright green coarsely toothed leaves about 1½ to 3 inches long, and bright yellow flowers in May.—F. J. C.

Elms, British. Notes on the status and nomenclature of. By Helen Bancroft (*Gard. Chron.*, vol. xcvi, Aug. 18, 1934, pp. 122-3. Nov. 24, p. 372, with 9 figs.).

Though Elms are seldom desirable trees for planting in gardens many fine old specimens are to be seen as important features in old gardens or in surrounding park or meadow land. These carefully compiled notes describe very clearly the distinguishing features of eight species or hybrids of this variable and beautiful genus, and provides what is considered the most correct scientific name, and the reasons for selecting it. They are:

1. The Goodyer Elm, *Ulmus minor* Miller.
2. Wych Elm, *U. montana* Stokes.
3. Smooth-leaved Elm, *U. nitens* Moench.
4. Cornish Elm, *U. stricta* Lindley, possibly *minor* × *nitens*.
5. Wheatley Elm, known as *U. nitens* var. *Wheatleyi* Simon Louis, and *U. stricta* var. *sarniensis*. Is perhaps *U. nitens* × *U. stricta*.

6. Huntingdon or Chichester Elm, *U. × vegeta* (Loudon) Schneider (*U. montana* × *nilens*).

7. Dutch Elm, *U. × hollandica* (Miller) Moss, perhaps *U. vegeta* crossed back with *U. nilens* or *U. montana*.

8. Common or English Elm, *U. campestris* L., of mysterious origin, has been supposed to have been introduced by the Romans or Crusaders, from Holland or Spain. It may be an insular variety of the continental *U. campestris* var. *australis* Henry, and more properly designated var. *anglica*.

The outline figures by Miss Jean Dickson and Mr. J. S. Shaw are excellent and show clearly the differentiating characters of these eight Elms.—E. A. B.

Iris kashmiriana. By W. B. Turrill (*Bot. Mag.*, t. 9378; Oct. 1934).—Considered identical with *I. Bartoni* (*Bot. Mag.*, t. 6869) with whitish flowers, native of Srinagar at 5,000 feet. A bearded Iris about 4 feet in height.—F. J. C.

Maxillaria fucata. By V. S. Summerhayes (*Bot. Mag.*, t. 9376; Oct. 1934).—Related to *M. grandiflora* and differing from *M. Huebschii* by its sepals and petals, white at the base, brown in the middle and yellow at the apex (the former spotted there with brown) and the distinctly trilobed lip. Native of Ecuador in all probability and flowering in the Odontoglossum house August to October.

F. J. C.

Megaskepasma erythrochlamys. By F. Ballard (*Bot. Mag.*, t. 9378; Oct. 1934).—Native of Venezuela and needing a warm house. A shrub up to 10 feet in height with large elliptic dark green leaves, and a panicle of white flowers with broad rose-coloured bracts.—F. J. C.

Muscari cyaneo-violaceum Turrill (*Bot. Mag.*, t. 9372; Oct. 1934).—A new species from Varna, in Eastern Bulgaria. It has broader leaves than *M. neglectum* and blue-violet flowers.—F. J. C.

Pests, Garden. Their detection and control. By G. Fox Wilson (*Gard. Chron.*, vol. xcv, pp. 14, 15, with 1 fig., and vol. xcvi, pp. 59–61, with 2 figs.).

These useful articles are in continuation of this series published in previous volumes. They deal with root troubles, the former with Aphis infestation and the injury caused by Springtails to Mangolds; the second with the depredations of soil-inhabiting creatures, slugs, millipedes and larvae of insects. Methods of control are suggested for each type of attack.—E. A. B.

Pieris formosa var. **Forrestii.** By H. K. Airy Shaw (*Bot. Mag.*, t. 9371; Oct. 1934).—This is the plant hitherto known as *P. Forrestii*, and it is characterized as differing from *P. formosa* by having larger flowers with a distinctly exserted style. The latter character is evident in only a few flowers in the figure. In gardens the plant is remarkable for the brilliant red of the young foliage. Native of N.W. Burma and Yunnan.—F. J. C.

Plants and Lime (Étude chimique de la calcéole et calcifuge de quelques espèces végétales.) By Nicolas Popovici (*Bull. Soc. bot. de Genève*, xxv, 1934, p. 123–196).—In this study Popovici has set himself to examine the chemical composition of the ash of certain pairs of nearly related plants which differed in their distribution, being found on limestone or siliceous soils respectively. A comparison is also made with the mineral contents of the soil in which they grew. As a result he found that the amount of silica in most of the plants examined was proportional to that contained in the soil, but in *Polygala Chamaebuxus* it was inversely proportional. The calcium content of the plants was also proportional in most cases, but inversely proportional in *Calluna vulgaris*, *Anemone alpina*, and *A. sulphurea*. There seems, therefore, to be a marked power of selection in these plants.

The results of his analyses of the various species into which the Linnean species *Gentiana acaulis* has been divided by Swiss and French botanists are of some interest, as they indicate that in their requirements and power of accumulating the mineral constituents of the soil they are certainly distinct. Thus *G. Kochiana* of Perrier and Songoon reputed to be a lover of siliceous soil contained from 22 to 26 per cent. of silica, while *G. angustifolia* Vill. and *G. Clusii* Ferr. and Song., which are calciphilous contained only 9.5 and 5.8 per cent. of silica respectively. On the other hand the lime content shows the reverse. *G. Kochiana* containing 10 to 15 per cent. of CaO, while *G. angustifolia* and *G. Clusii* showed 29 and 28 per cent. respectively. It would seem, therefore, that the distinction between these three forms of *G. acaulis*, which is based on morphological features, is borne out by their physiological activities.—F. E. W.

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Part 4

April 1935

SOME PLANTS OF KASHMIR.

By T. HAY, M.V.O., V.M.H.

THE beauties and attractions of Kashmir have been the theme of many books. It is a land as rich in romance as it is in sapphires. Legend has it that the Valley of Kashmir was originally a lake and that it was drained by the wise Kasyapa, grandson of Brahma, by cutting the gap through the mountains at Baramula, and the physical conformation of the country lends credence to the ancient tale.

Of the many books on Kashmir, still one of the most fascinating and authoritative is that entitled *The Valley of Kashmir* by Sir WALTER R. LAWRENCE, G.C.I.E., G.C.V.O., etc., published by the Oxford University Press in 1895. Sir WALTER was Land Settlement Commissioner for Kashmir and Jammu State in 1889, and his task took nearly eight years, and the Kashmir of to-day is a very different country from that of 1889; peace, prosperity and progress swiftly followed the wise provisions of the Lawrence Land Settlements and to this day the name of LAWRENCE is held in the highest esteem by the peoples of Kashmir, but Sir WALTER's book is no mere account of his work there, it provides a first-hand history of this very ancient country, its customs, peoples, trade and agriculture. The flora of the country occupies many pages and is from the pen of the late Mr. J. F. DUTHIE, who was Director of the Botanical Survey of Northern India; this list contains only the plants found in the neighbourhood of Gulmarg.

The climate of Kashmir varies from tropical to temperate and alpine, and many European plants find their eastern limit there, which gives a European cast to the vegetation. The Cherry is truly wild in Kashmir, while Lombardy Poplar, Walnuts, Crataegus, and other

familiar trees are abundant. It is the only Indian State having great lakes and the climate is such that most of our temperate fruits, such as apples, pears, plums, strawberries, apricots and peaches, are widely cultivated. PANDIT, in his introduction to the *Rajtarangini* (The history of the Rajahs), says of Kashmir "it is a country where the sun shines mildly, being the place created by Kashayapa as if for his glory. High school-houses, the saffron, iced-water and grapes, which are rare even in heaven, are common here. Kailasa is the best place in the three worlds, Himalaya the best part of Kailasa, and Kashmir the best place in Himalaya."

The flora of Kashmir has received more attention from the botanist than that of any other Indian State and, while it is well covered by Sir J. D. HOOKER in his indispensable *Flora of British India*, there are several noteworthy books dealing solely with the flora of Kashmir. The oldest and still the most desirable is Dr. ROYLE's *Illustrations of the Botany of the Himalayan Mountains and of the Flora of Cashmir*, two folio volumes, one of text and the other of very beautiful coloured plates; these were published in 1839 and are referred to by PRITZEL as *Pulcherrimum Opus*.

Within recent years the flora of Kashmir has been made known to us by Mr. B. O. COVENTRY, late of the Kashmir Forest Service, in three delightful volumes entitled *Wild Flowers of Kashmir*. The three volumes contain one hundred and fifty plates, which are reproductions from direct coloured photographs taken on Lumière autochrome plates by the author, and represent a fine selection of choice alpine and herbaceous plants found in Kashmir, many of them now introduced to cultivation. The text will appeal to, and satisfy, both the gardener and the botanist; these three volumes were published between the years 1926 and 1931; it is to be hoped that Mr. COVENTRY will continue his good work and add to this attractive series.

In 1927 there was published vol. 1 of *Beautiful Flowers of Kashmir*. The distinguished author, E. BLATTER, had previously published a great deal on Indian plants, and his death in 1934 was a severe loss to Indian botany; a second volume was published a year later. The author does not claim this work to be a complete flora of Kashmir, but the number of species described runs to several thousands, and six hundred plants are figured. The illustrations are in colour and from six to ten plants are given on a page, and though small are sufficient to give an idea of what the plant is like. To those interested in the flora of Kashmir these are two of the most useful and comprehensive volumes available.

In 1903 there was published in Nottingham a work entitled *Some Wild Flowers of Kashmir* by EMILIA FRANCES NOEL; it contains full-page pictures of the more decorative plants and many interesting notes concerning them. This book has been issued with both coloured and plain plates and appears to be a very scarce book, but can be referred to in the Royal Horticultural Society's Lindley Library, which contains copies of all those mentioned here.

Kashmir has now become a popular attraction for the tourist and world traveller, while for British residents, both civilian and official, it is a welcome relief from the heat of the plains. The publication of many books on its beauty and other attractions and particularly the handy and excellent Floras already mentioned, have all had their share in making many of the plants of Kashmir long known to us, but we have become acquainted with them of late years in increasing numbers, owing to the enthusiasm and activities of Mr. AMIN CHAND, Deputy Conservator of Forests, a gentleman who has a unique knowledge of the flora of his native country, a knowledge probably unsurpassed by any other resident in Kashmir, native or European.

This officer has roamed the country collecting seeds and plants and has a first-hand acquaintance with the alpine and herbaceous flora of the country, having seen most of the floral treasures of Kashmir growing in their native habitats. He has also an eye for a good species and one that is likely to be appreciated as a garden plant. The best proof of this is seen in the large number of plants collected by him that have been honoured by the Royal Horticultural Society's Floral Committee. In appreciation of his services he was given the Gold Medal of the Society in 1933. To him we are indebted for such plants as *Adonis chrysocyathus*, which is described by COVENTRY as one of the gems of Kashmir. *Aconitum cordatum*, a delightful little species for the rock garden (fig. 28); *Nepeta nervosa*, a very serviceable long-flowering border plant; *Anemone tetrasepala*, a robust white-flowered plant greatly appreciated by those interested in this genus (fig. 29); *Campanula argyrotricha* (fig. 30) and *C. alsinoides* (fig. 31), lovely little species for the rockery; *Scabiosa speciosa*; the handsome *Phlomis cashmiriana*; *Mertensia moltkoides*, one of the most desirable of rock plants and of a lovely shade of blue; bulbs and seeds of such rarities as *Colchicum luteum*, the only yellow-flowered species, and of *Lilium polyphyllum*; *Paraquilegia grandiflora* and *Meconopsis aculeata*, the only species found in Kashmir.

Recent arrivals include *Primula Inayatii* and the rare *P. Clarkei*, *P. elliptica*, and other species; a restocking of our gardens with the desirable *Gentiana Kurroo*; *Allardia tomentosa* and *A. glabra*, both unfortunately proving rather difficult; the more easy *Eritrichium strictum* and the robust *Lindelofia longiflora*, two first-rate blue-flowered plants; *Gentiana Moorcroftiana*, a great treasure; *Trollius acaulis*, the earliest flowering species; *Morina Coulteriana*, the only species of the genus having yellow flowers, and the desirable *Caltha palustris* var. *alba*.

From this list of plants given as being in cultivation, a catalogue that could be greatly extended, we form some idea of the contribution Kashmir has made to our gardens, and to the enterprise of this energetic forest officer.

Nor is the flora of Kashmir nearly exhausted, as many desirable plants mentioned by the authors named still await introduction. We are still without several of the fine *Nepetas* in which Kashmir is rich. One of the most desirable is *Nepeta floccosa* which has attractive pink

or rich rose-coloured spikes. *N. leucoleana* is another conspicuous species forming great bushes four feet high, with lavender-blue flowers. BLATTER describes over twenty species of *Nepeta*; they are of all heights, and range in colour from white, yellow and rose to lavender and deep blue. Many of them give promise of being first-class plants for the herbaceous border.

The arrival of *Corydalis cashmeriana* has given great pleasure to alpine plant enthusiasts and is considered to be one of the most desirable of the new plants of 1934. There are still many fine species of *Corydalis* to be introduced; *C. crassifolia*, already here but in limited quantity, has hardly got over its first appearance in gardens but will be admired later, and there is in cultivation a species resembling our native *C. lutea*, with more glaucous and finer foliage and with the yellow flowers tipped with black, a very striking colour combination.

Included among the dozen or more species found in Kashmir, *C. Govaniana* as figured by ROYLE seems to be particularly desirable.

We are now without *Aster Falconeri*, which was one of the sensations of the Chelsea Show of 1913, when exhibited by Messrs. Barr; nothing shown of recent years under the same name can be compared to Messrs. Barr's plant which received the Award of Merit. No known *Aster* species or hybrid can compare with the true *A. Falconeri* in size of flower, and the colour is also very satisfactory.

Another very handsome genus which our plant explorers have neglected is *Eremostachys*. With the exception of *Eremostachys laciniata*, the only one that seems to be procurable, all are still unknown as garden plants. Allied to *Phlomis* they surpass the *Phlomis* in stateliness and elegance. REGEL in 1886 published a monograph of the genus; it is in Russian and so the text is beyond the grasp of most of us. This little book must have also been a puzzle to a well-known firm of dealers in scientific literature, as the only copy I have ever seen offered for sale was included in a catalogue of works on Zoology and offered under the section Crustacea. REGEL figures nine or ten species and these give some idea of how desirable this genus might be. ROYLE has a striking figure of *E. superba* which has a wide Himalayan range but does not seem ever to have been introduced. *E. macrophylla* is another species found in Palestine that is of great merit. A glance at t. 7048 of the Bot. Mag. will give a good idea of how attractive this genus might be.

Kashmir is rich in *Gentians*, BLATTER describes about twenty-five species and this does not exhaust the list. Many of the Himalayan species are now in cultivation, but we are still without *Gentiana coronata*; if ROYLE's figure of this can be relied on we can still look forward to one of the most remarkable of all *Gentians*.

Potentilla microphylla of both yellow and crimson colouring has been introduced, but its stay was brief, no doubt due to lack of knowledge of its requirements. The plants seem to be dwarf cushion plants from high altitudes, are but an inch high, and studded over with the most brilliant crimson or yellow blossoms.



FIG 28—ACONITUM CORDATUM

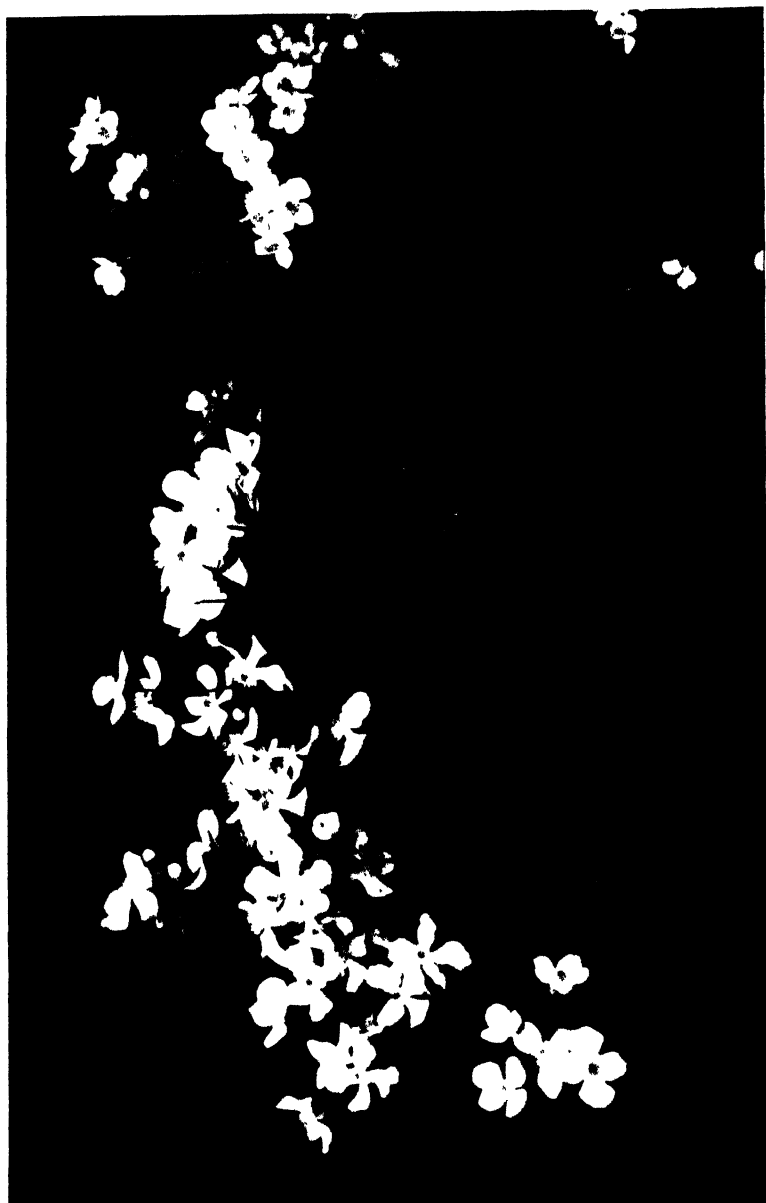


FIG. 29. ANIMONTI DI TRASLEPATA.

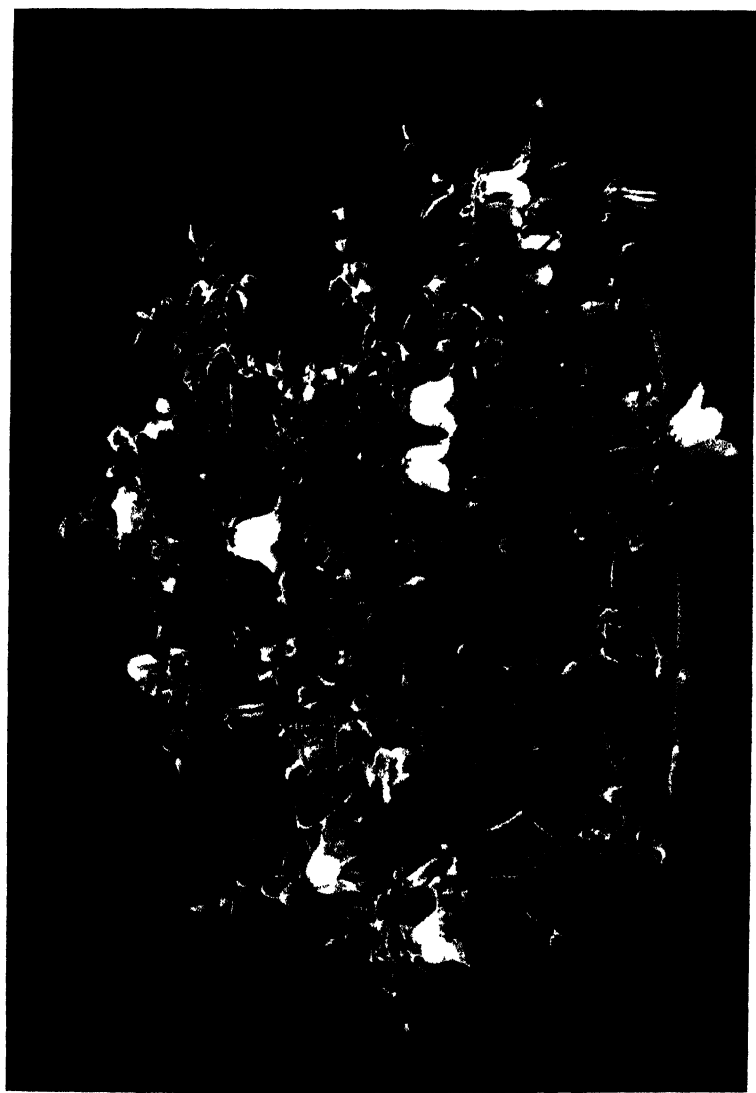


FIG. 30.—*CAMPANULA ARGYROTRICHA*



Fig. 34. *CAMPANULA ALSINOIDES*.

There is also an extensive list of *Primulas* accredited to Kashmir ; among those less seldom seen in cultivation are *Primula Clarkei* already mentioned, *P. hazarica*, *P. elliptica*, *P. reptans* (this is in cultivation but very sparingly), *P. Stuarti*, the *P. erosa* of Wallich which has always been more or less of a mystery, and that species the pronunciation of which has been suggested for the police sobriety test and which is spelt *P. Schlagintweitiana*.

The good qualities of *Mertenisa molkoides* as a rock plant have already been mentioned and FARRER waxes enthusiastic over the beauties of *M. molkoides* var. *Thomsonii* which, he says, haunts the heights of Kashmir.

There are several genera strongly represented in Kashmir that we know very little about, but which, from descriptions and figures, seem to be well worth a trial. Among these may be included the *Pleurogynes* and wonderful *Saussureas* many of which make their home in the clouds and defy ordinary methods of cultivation, but seem to provide an opportunity for those who are still looking for new worlds to conquer. Among the vast number of species of *Astragalus*, *Polygonum*, *Allium*, and many other genera there are still finds to be expected, in spite of the many able collectors who have worked there and the many years' experience we have had of Kashmir plants. Then there are the greatest mountain ranges of this earth that guard it from the outer world ; these are far from being exhausted of plant treasure and that vast hinterland beyond the Himalaya is still botanically but little known.

SALAD VEGETABLES IN THE PRIVATE GARDEN.

By A. PAYNE.

[Read February 5, 1935 ; Mr. W. F. GILES in the Chair.]

I HAVE the honour this afternoon of being invited to talk on the subject of Salad Vegetables in the Private Garden, a subject which, if dealt with thoroughly, would take up far more time than that at my disposal. I will, therefore, touch only upon those subjects in greatest demand and in more or less everyday use.

To keep up a continuous supply of fresh Salad Vegetables all the year through is no mean achievement, and necessitates a certain amount of glass in the shape of small forcing houses, heated pits and cold frames, but with the necessary materials at hand, such as long straw manure and tree leaves, with which to make hot-beds, it is possible to carry on the supplies during winter and early spring. We may take the principal kinds in succession beginning with cucumbers.

It is a comparatively easy matter to produce first-class cucumbers in the height of summer, when they can be cultivated with success in a portable frame with little or no hot-bed material to assist growth. To carry on the supply throughout the autumn, winter and spring is, however, a different matter, and impossible of achievement unless a glass house especially built for the purpose is available.

This glass house for cucumbers should be of medium size, with space provided to accommodate a good bulk of hot-bed materials, in addition to a sufficient supply of artificial heat to maintain a temperature of from 70°-75°. Broadly speaking, sowings made in February for the cucumber house, May for the cold frames, and again at the end of September or early October for winter work, will carry the crop through, but a good cultivator will always be ready to raise fresh plants should the old ones, from any cause whatsoever, begin to show signs of distress. With regard to a rooting medium for cucumbers, good fibrous loam with spent stable manure in equal parts will suit well, and, when the plants are growing healthily, weekly top dressings of a similar compost should be given, to which might be added a 3-inch potful of bone meal to the bushel of soil. To keep the plants in a healthy state some form of shading should be afforded. This will, to a great extent, govern the amount of ventilation needed. With shading, air should not be given until the temperature rises above 80°, and the house should be closed, the plants thoroughly sprayed, and the walls and floor damped down as soon as the temperature falls below that level. In spring and summer the plants should be stopped when the lead reaches the full height of the trellis and side shoots at the second leaf beyond the fruit. For winter crops, the plants should be carried

through with as little stopping as possible, the cultivator being content to regulate the growths evenly over the trellis, only stopping the point of the leading shoots when necessary to keep the plants within bounds.

Tomatos.—The production of a continuous supply of tomatos, at least for ten months out of the twelve, is a much simpler matter, provided there be a light span-roofed glass house available, which can be freely ventilated at the sides and top, and where a temperature of 50°–55° can be maintained. The principal times for sowing to maintain a continuous supply are January for the warm house, March for the cold house and outdoor cultivation, early July for the winter supply, and the middle of October for the first supply in the New Year. The last two sowings are best brought along and fruited in 10-inch pots, those from the July sowings being stood on ashes out of doors after being potted into their final pots, until the end of September or the beginning of October, according to the weather conditions outside. For compost, tomatos delight in good fibrous loam with well-rotted manure or leaf soil, according to the nature of the loam, a sprinkling of mortar rubble with some form of potash added to assist to keep the plants in a healthy state. Potting should be done very firmly to encourage the plants to make short-jointed growth, and the pots should be filled half full of soil in the first instance, leaving room for several top dressings as growth proceeds.

A very important point is free drainage, and the pots should be thoroughly clean and thoroughly crocked before potting takes place. For the summer supply plants should be planted out on to the benches in cold houses giving just sufficient compost to cover the balls in the first instance, and adding more as required. Some varieties of tomato of the ranker growing sorts do very much better when treated in this way, as they are not so liable to run to wood, notably 'Carter's Fruit.' There is not much difficulty in raising tomatos from seed. Seed germinates quite readily in light sandy soil in a temperature of 60°. Seeds taken from a half-ripe fruit, plucked straight from the vine, will germinate more quickly than dried seed, and will usually grow away to make more robust plants and carry a good crop.

Cleanliness plays a very great part in the successful cultivation of tomatos. I am sure that more than half of the diseases one hears of, such as stripe, black spot and wilt disease, are caused by dirty houses, insufficient ventilation or unbalanced feeding. Glass houses used for the cultivation of tomatos should be kept scrupulously clean, little space for any other plant should be allowed. After completion of each crop the house should receive a thorough cleansing from roof to floor, all glass, woodwork and walls should be thoroughly scrubbed down with warm soap and water, to which a little disinfectant (such as paraffin or Jeyes' Fluid) has been added. After this the walls should be whitewashed, and while the house is empty it should be thoroughly fumigated with Cyanogas, always being very careful to follow the directions printed on the container. In the height of summer too

much ventilation cannot be given to tomatos ; air should be admitted freely through both top and side ventilators so as to ensure free passage through the houses. As autumn draws near and the plants that are to do duty for the winter supply are housed, side ventilation should be dispensed with, and air should only be admitted by the top ventilator according to weather conditions. Never should the houses be entirely closed down, a little air being admitted night and day, with sufficient heat circulating in the hot-water pipes to keep the temperature at 50°-55°. The plants should be fed with some approved fertilizer at frequent intervals, especially when carrying heavy crops of fruit, with an occasional application of sulphate of potash in the soil used for top dressing, using one 5-inch potful of sulphate of potash to the bushel of soil. This will assist in keeping the plants in a healthy condition and resistant to disease.

Celery.—This is a popular winter salad and one that is fairly easy to produce from the end of September until early spring, if cultural detail is studied. An inhabitant, in its wild state, of marshy places, it should never be allowed to become dry or receive a check in the early stages of growth. March should be soon enough for the first sowing, making another sowing about the middle of April. Seed germinates readily in a temperature of 60°, and should be sown very thinly in a light sandy soil, using shallow pans or boxes for the purpose. By the time the seedlings are ready for pricking out, the outside conditions should be so much improved as to allow the use of a portable frame in which to transplant the seedlings. The method which I have adopted is to place a frame in position on a hard ash bottom, in which a bed is made up consisting of 3 inches of rotten manure over which 2 inches of old potting soil is placed and made level. The seedlings are then pricked out 4 inches apart each way, and the frames are kept closed for a day or two to assist the seedlings to recover from the shift. After this, air is admitted and increased gradually to enable the young plants to grow sturdily. The frames should be covered with mats at night when weather conditions render it necessary.

The trenches for celery should be prepared well in advance, so that there is no delay in planting when the young plants are ready. By this time we have come to the season when things grow apace and a few days' neglect will spell ruin for the crop. I much prefer to plant celery in single rows, as by so doing it is much easier to keep clean, water, and finally earth up. Another great advantage, to my mind, is that, in the event of a dry season such as we have recently experienced, single rows can be more easily mulched down each side with long straw litter, with immense advantage to the crop and the saving of labour in watering. A great mistake is so often made, in my opinion, in planting celery in trenches that are too deep. The soil being taken from the trenches right down to the subsoil, manure placed along the bottom and covered with 2 or 3 inches of top soil in which to set the plants, leaves very little fertile soil in which the roots can roam to find moisture and nourishment, and in poor shallow soils they

can hardly make headway at all. I strongly advise that shallow trenches should be used, 6 inches deep at the most when finished, so that plenty of fertile soil is left for the roots to roam in, with a liberal dressing of well-rotted stable manure mixed into the soil. At planting time the advantage of the hard ash bottom on which the seedlings are pricked out will become apparent, as the young plants will be found more easy to separate with a trowel, and can be lifted without injury for planting with a good ball of soil attached. Quite 12 inches should be allowed from plant to plant. Blanching should commence when the plants have made sufficient growth, approximately eight weeks before being required for use, and the whole crop should be completed before the end of October. The quality of the celery will be greatly improved and the labour of earthing greatly reduced if, before drawing the earth up to the plants, each stick be provided with a brown-paper collar 6 to 8 inches wide and sufficiently long to make a double wrap round each stick, the collar being kept in position by a strand of raffia tied loosely round the centre. Earthing should be completed in three processes, adding 4 to 6 inches of soil at intervals of ten to fourteen days, until earthing is complete. Of recent years leaf-spot has been very prevalent among celery, and I have adopted the method of spraying the plants with Bordeaux mixture at frequent intervals through all stages of growth until earthing commences, starting from the seedling stage, with very good results.

Lettuce.—No salad bowl is complete without lettuce. With the improved varieties offered by the various seed houses, and with the help of the necessary pits and frames, good lettuce can be obtained at almost any time of the year. Seed can be sown at intervals from early January to August. The earliest sowings should be grown under glass and transplanted into heated pits or frames on hot-beds, from which good-hearted lettuce should be ready for cutting in April. Additional sowings should be made at intervals of a fortnight to provide plants to be planted out on the warm border or any sheltered spot that can be devised. From March to August sowings can be made at regular intervals out of doors. I very much favour sowing the seeds very thinly where the plants are to remain, thinning the seedlings to the required distance when they are large enough to handle. By doing so much finer lettuces are obtained, with the added advantage that they stand better in the dry weather. The mounds between celery trenches undoubtedly provide the best site for summer lettuce, the extra soil thrown up from the trenches suiting them well. If it is possible to add a little short manure to the soil just below the surface so much the better. The August sowing of lettuce is a very important one, as from that sowing supplies should be obtained in the early spring, as well as the maintenance of the supplies in the winter. The selection of the variety is of the utmost importance. There are good hardy varieties on the market that will winter well under bell glasses, and even out of doors in favoured places, whilst such early maturing varieties as 'First of All,' 'Golden Ball,' and 'Early Paris Market,'

will keep up the supply in heated pits, frames on hot-beds, and cold frames. All late maturing crops of lettuce should be lifted from the open ground with as large a ball of soil attached as possible, and transplanted into frames before the bad weather sets in in the autumn, to carry on the supply as long as possible.

Beet is another popular salad, which is at its best when quite young, small roots having far better flavour than the large coarse specimens so often seen. The round and intermediate varieties force very readily on mild hot-beds from January onwards, and the supply of fresh young roots can be maintained well into the winter by the use of pits and cold frames. Small successional batches of these varieties should be sown at intervals throughout the spring and summer, using each batch before roots become too large. I think this method much preferable to sowing one large main crop in May and storing the roots in autumn for winter use.

Radish can be produced almost all the winter through by the aid of mild hot-beds and portable frames, and they present very little difficulty in the open in an ordinary season. To keep up a continuous supply frequent small sowings should be made at intervals of seven to ten days. To be at their best radish should be grown quickly, and such aids as may be necessary to achieve that end must be resorted to, thinning and watering, and feeding in the shape of some approved fertilizer occasionally. Radish requires approximately three weeks to mature from the time of sowing the seed. Black Radish and Chinese Rose may be sown in July and August, lifted in the autumn, and stored in sand for winter use, but, in my experience, these varieties do not find very much favour.

Lastly, no paper on Salad Vegetables would be complete without mentioning *Mustard and Cress*, a great favourite with almost everyone and quite simple to produce at any season of the year, provided that a glass house is available for the winter supply. For the raising of mustard and cress I much prefer shallow boxes of a convenient size, filled to two-thirds of their depth with flaky leaf soil pressed firm. The seed should be sown thickly over the smooth surface and lightly pressed in. A sheet of glass or brown paper should be laid over the boxes to preserve the moisture until germination takes place. Then the boxes should be placed in the full light in an intermediate temperature. The mustard and cress will be ready for cutting in seven days. The advantage of using leaf soil as a rooting medium is that it is clean and free from grit.

PERENNIAL LUPINS.

By the EARL OF DARNLEY.

A GARDENER who wishes his garden to be completely in tune with the surrounding landscape should look for subjects that are capable of being planted in large numbers at small expense—for to have his effects in harmony with the existing landscape he must plant sufficient of any plant or shrub to make an effect proportionate to those already there in the form of tree masses, groups of shrubs and evergreens and areas of lawn or water.

For he will realize that the subjects he is about to plant will have to bear being seen at a distance as well as being pored over from a few yards, and therefore the grouping thereof must never be allowed to look dwarfed or spotty in relation to the surroundings from any view-point, but be as ample and natural as it would be in its native home.

Many shrubs can be readily used for this purpose, such as Rhododendron, Azalea, Pyrus, Prunus, Laburnum, etc., though they are not in most cases cheap, but when it comes to herbaceous plants there are few that have the necessary qualities of hardiness, showiness and cheapness; but among them the Lupin stands alone for its pre-eminence in all these qualities. Planted in large numbers with a suitable background and in natural shapes they will give the most wonderful floral display for years, and in addition need little attention beyond occasional weeding and hoeing.

The production of these large numbers of plants is easy and cheap, their rate of mortality is low and therefore little replacement is necessary; they are not attacked by rabbits, pheasants, slugs or other pests, and therefore make excellent subjects for a gardener of small means who wishes to have an effect of beauty in his garden as well as a collection.

Cultivation.—With a plant so well known there can be little to write about under this heading. I have always collected seed from the best colours and sown them in the nursery garden in rows like radishes in March or April. This is for the main supply of plants for the mixed beds. They should be transplanted 1 foot apart when 6 inches high, but I try to avoid the necessity for this by very thin sowing; the seedlings can then be left in the seed rows till the time comes for them to go to their permanent quarters. I always watch the seedlings carefully the first year in case a new colour appears, and keep the seeds saved from the different colours in separate rows to watch the tendencies of colour improvement, and have got good results therefrom.

The named varieties and special colours can best be reproduced by cuttings taken in the spring. These can be struck in the open in rows if the soil is light and suitable, but it is safer in boxes. They should all flower the same summer and make good plants the following year. Once a stock has been obtained by these means it is a simple matter to transfer them to their permanent homes.

The areas which have been prepared for them, provided the ground is not too heavy or poor, requires nothing more than a fairly good and deep digging. I have never trenched the ground for them, but in clay I have added disintegrating materials such as ashes and burnt clay, and in light soil added humus locally obtainable in the form of turf or leaf mould, and perhaps a little manure. In ordinary soils the mortality rate is something like 5 to 10 per cent. per annum, and in heavy soils perhaps a little higher, so that a small stock of seedlings for replacement should be grown each year. Two feet apart is a suitable spacing and ensures the effect being solid enough.

Their flowering season is a long one and lasts from about May 15 to June 20, a good deal longer than most herbaceous plants.

After flowering I have found that it is best only to cut off the seed head of each spike. If the plant is cut down to the ground, an ensuing hot period may kill a good many, and anyhow the plants look better with all their foliage.

I have planted them at all times of the year, but established plants are probably best moved in March, though October to Christmas is probably nearly as good, except for hybrid varieties which do not move so easily.

Types and Species.—The three types of Lupins most commonly met with are the true Polyphyllus, the Tree Lupin (arboreus), and the hybrids between the two. There are also probably traces of some of the other species from California or Africa, such as *Lupinus Paynei*, in some of the varieties seen, but the main types are as above described and it is not intended to deal with the others.

The true Polyphyllus is a purple-blue flower which, like so many flowers of its colour, such as Campanula, Aster, Scilla, etc., has pink and white varieties. It used to have a long, straggly flower stalk with flowers set rather apart, but by selection and cultivation is now offered for sale with a long, fat, solid spike. This type is the hardiest, strongest and easiest to cultivate, and as long as it is pure bred will give little anxiety. Unfortunately the really pure-bred ones have little colour variety and the best colours have other blood which makes them much less satisfactory, and it is a sad fact that the best and loveliest colours seem to have the least chance of surviving, but as this applies to most flowers that suffer from a surfeit of keen hybridizers it is at any rate not a speciality of the Lupin. The Tree Lupin is normally yellow, but has a white and lavender variety, the latter being probably some kind of a hybrid. It is a much-neglected plant probably on account of the fragility of its woody branches, which get broken very easily by snow or wind. It is best grown either in a shrubbery after the manner



FIG. 32 — PERENNIAL LUPINS IN THE BORDER.

To face p. 152.



Photo by courtesy of Legation, Tiflis.

FIG. 33.—PERENNIAL LUPINS IN GRASSLAND



FIG. 34 - PERENNIAL LUPINS IN INFORMAL PLANTINGS



FIG. 35 - PERENNIAL LA PINN NAR THE WATERSIDE

[To face p 153.

of gorse or broom, in a place where it can look after itself and where its somewhat untidy appearance will be overlooked, or else taken great care of by tying, staking, etc., in a sheltered formal spot in the intimate garden. Here it can be made to grow against walls like a climber, or made into standards, but will only suffer one move, and that is in its first autumn. I have made standards 8 feet high by tying the seedlings to stakes and cutting off all side shoots to the very top for three years, and no doubt if wanted they could be higher still. It has a wonderful scent, and its narrow emerald-green leaves are graceful and beautiful, and it could be grown more extensively to great advantage. Its flower spikes are very short and full: in fact the length of the flower spikes is a sure guide as to the Lupin species, those of *Polyphyllus* being very long; the foliage is another indication, that of *Polyphyllus* being coarse and strong, and that of *arboreus* fine and delicate and of a more emerald-green. *L. arboreus* will root easily from cuttings struck in boxes in March or can be grown from seed like *Polyphyllus*.

Hybrids.—These are responsible for most of the best colours found in herbaceous Lupins. Their nearness or otherwise to the true *Polyphyllus* can be found by examination of their leaves and flower spike as described above, and the nearer they are to *arboreus* the more delicate and difficult do they become to propagate and keep alive. There are many special strains of these hybrids offered for sale, some for their scent and others for their colour variety, and it is perhaps a pity that a lot of the uglier ones have not been burnt and a more standard colour scheme observed.

The hybrids can be propagated by cuttings in boxes in the spring or stem cuttings in the autumn. In the event of a hybrid of a good new colour appearing in the seed bed it is strongly advisable to take stem cuttings in the autumn as the plant may die in its first winter and the novelty be gone for ever. I have lost several lovely new varieties through neglecting to do this.

The scent of hybrids is greater and their hardiness less as the type approaches *arboreus*.

Colour.—Lupins can be bought now of nearly every colour but scarlet and sky-blue. It is true that a lot of the colours are borne by delicate plants, but they are to be bought anyhow, and if the buyer is prepared for a somewhat short life for his plant, and takes care to keep on propagating it by cuttings in the knowledge that though alleged to be of the *Polyphyllus* blood it is really a hybrid, he will not be disappointed.

A good example of this is 'Sunshine,' a brilliant yellow often sold as *Polyphyllus*, but really only one-quarter so. There would appear to be a need nowadays to try and eliminate the washy and bad colours from these flowers, as there are good and pure tints to be obtained in all the colours. The pinks suffer very much in this respect, some of the most advertised and expensive being of that ugly brick tint and others fading off the shade of a mouldy plum before the spike is properly out.

The following shades can be got in perfectly pure tones, and doubtless others will be added later on.

Pure White.	Pink Pale.
Ivory White.	Pink Medium.
Cream.	Red Crimson.
Butter Yellow.	Lavender.
Lemon Yellow.	Maroon.
Sulphur Yellow.	Violet.
Dark Orange.	Dark Blue.
Light Orange.	Pale Blue.

I have all these in the garden at Cobham, and all pure and not washy or faded, and no doubt they are obtainable from many other growers.

For years I have been trying to get a scarlet or sky-blue Lupin. The sky-blue has so far evaded me, but at last I have a pretty good scarlet which I hope to exhibit shortly.

My best pale blue is still too lavender, but I hope the real sky colour, that of Delphinium 'Mrs. Paul Nelke,' will materialize one day. I have a specially lovely collection of pinks, perfectly clear and true and of good habit. Each year some new colours emerge from the seedling beds which go to the trial bed for test as big plants and then into stock lines as new colours. In addition to the pure colours it is interesting to collect stocks of certain bi-coloured varieties and other indescribable shades or combinations of shades. These are often unnoticed when appearing singly in a big bed, but look better when collected into groups of their own colour and give curious and interesting effects. I have one called 'The Pearl' which has all the colours of an oriental pearl and had one plant of the loveliest Lupin I have ever seen, opening yellow, then turning a bright rose-pink and dying off yellow again, but alas, I neglected to take cuttings in its first autumn and it died in the winter. It is perhaps a pity that so much attention is given by growers to the production of those enormous, long, bulky spikes. Size is not everything in flowers and the craze for this has vulgarized many a flower before now. Gracefulness of habit and proportion with good fine colour should surely make a better aim for every plant. It is a great pity that the Lupin is such a bad flower for the show bench. If cut it is usually in a semi-faded state and the weakness in colouring of many varieties is thereby much accentuated. It is better shown in pots, but these somehow do not permit of the plant attaining its full magnificence, and it looks attenuated and starved, but the pot seems really the only solution.

Garden Display.—It will probably be found simplest, if a really fine show of plants is required, to have the main large masses of mixed seedlings grown from seed saved from good varieties which can be depended upon to produce good plants at little expense. At Cobham there are probably fifty thousand planted in this way, while the beds that are most seen and nearest to the house have special colours only, and it is hoped in time gradually to extend this system to the mixed beds. I have worked

up a large stock of the crimson one called 'Emperor' and have it with 'Sulphur Gem' (yellow) and 'Porcelain' (pale blue). Later on I hope to have large plantings of the various pinks and oranges, but so far the stock is not large enough.

Anyone who wishes to obtain effects of this kind can easily and cheaply do so. He need only purchase a few named varieties to start from and a pound of mixed seed, and in two years his effect will be there. A good gardener can dig enough ground to plant one thousand Lupins in one day provided there are no roots or stones to remove, and really the only difficulty of the operation is the choice of site for the beds and the shape and size thereof. But each site will give advice on its own. There are always groups of trees whose lines and shadows will give shapes and whose bulk will suggest proportionate size, and if not trees there will be shrubs, or varieties in the contour of the ground. Even in a bare, flat field shapes can be made with grace of outline and the size of the beds judged merely by the appearance they will have, seen over a clean, unbroken foreground which is a *sine qua non* with all big garden effects, from the agreed point of view.

If the Lupin is given this grand treatment it will certainly repay its planter with many days of enjoyment, giving him something of the wonder and wild excitement of Nature's own gardening at its best and make a pleasant contrast to the parts of his garden where he has been obliged to garden collectively or architecturally.

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

LXXIII.—LEAF SPOT OF DAPHNE MEZEREUM

Caused by *Marssonina Daphnes* (Desm. et Rob.) Magn.

By D. E. GREEN, M.Sc., Mycologist, Wisley.

In some gardens *Daphne Mezereum* is a source of anxiety, but the fault is generally found to be at the roots, either owing to unsuitable soil conditions causing weakness, or to actual attack by some fungus parasite. The latter would, of course, be encouraged by the former. Diseases of the foliage are rare in *Daphnes*, and the only disease of this type hitherto recorded in Great Britain seems to be the one caused by *Gleosporium Mezerei* Cooke, which forms small brown pustules on the upper surfaces of the leaves. Even this fungus is but rarely reported.

There is no doubt that another leaf disease of *D. Mezereum* is now present in Great Britain, and a note describing the symptoms has already been published.*

In May 1934, leaves were brought to Chelsea Show for examination. The bushes were said to be growing in a sheltered position, had always appeared healthy and always flowered well. They had developed spots on the leaves and were being defoliated. Information was later received that both 12-year old and 3-year old bushes in different gardens were affected.

Examination of the leaves showed them to be green and healthy looking except for numerous brown spots on both upper and lower surfaces.

The spots or pustules were present on all parts of the leaf surface, but most were situated near the lower half of the main vein, and especially on the narrow basal portion of the leaf (fig. 36). A significant feature was that nearly all the specimens had three or four pustules on the stalk-like base, and this was consequently black and withered (fig. 36). This type of attack would naturally cause rapid defoliation, and is often seen in other diseases, notably the Black Spot fungus attacking the petioles of otherwise healthy rose leaves.

Microscopic examination of the pustules showed that they were the result of attack by the fungus *Marssonina Daphnes* (Desm. et Rob.) Magn., this being the first time this fungus has been recorded in Great Britain. It is known as a parasite of *D. Mezereum* in France, Holland and Germany, and according to LAUBERT † in Germany is considered very injurious to this plant.

* A leaf spot of *Daphne Mezereum* new to Great Britain, *Gardeners' Chronicle*, Oct. 27, 1934, p. 305.

† LAUBERT, R. A very injurious disease of *Daphne Mezereum*, *Blumen und Pflanzenbau*, 49, 9, 1931, p. 138.



FIG. 36. DAPHNE LEAF-SPOT CAUSED BY *MARSSONINA DAPHNES*

[To face p. 156.]



FIG. 37. ---LILY OF THE VALLEY

The pustules contain masses of spores formed by the fungus living in the leaf cells below. The spore masses (acervuli) are formed beneath the epidermis, which, by growth of the fungus, is at length ruptured to release the spores (fig. 38*a*). These can then be washed or blown about

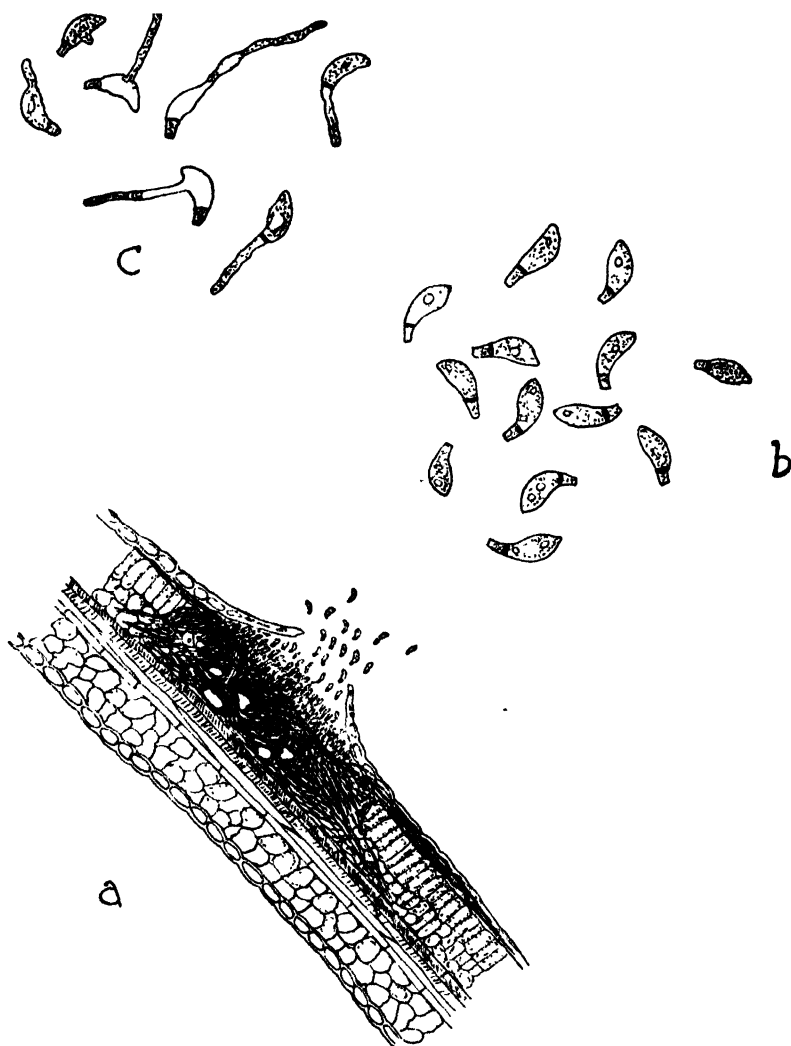


FIG. 38.—MARSONNINA DAPHNES ON DAPHNE MEZEREUM.
a, Acervulus. b, Spores. c, Spores germinating.

by rain or wind, or carried by insects to healthy leaves, where they may germinate and cause infection. The spores are hyaline, unequally two-celled (the larger cell being almost three times the size of the smaller), and slightly sickle-shaped (fig. 38*b*). They measure $20\ \mu$ long, and $6\ \mu$ in diameter at the widest part (average of 100 measured) and there is very little variation in the size of mature spores.

The leaf tissues around a pustule are killed, and as the pustules

increase in number a severely infected leaf soon turns yellow and defoliation commences. Not only do badly infected leaves fall, but those almost free from disease are in danger if attacked on the stem near the axil.

The viability of the spores was tested and they were found to germinate freely, if somewhat slowly. At 20° C., in distilled water, germination of some spores commenced on the fifth day and by the eighth day there was generally good germination. The majority of the spores produced germ tubes from the larger cell, but this was not always so, for in some the smaller cell germinated first (fig. 38c).

With a view to discovering how the fungus overwinters, some shoots bearing infected leaves have been kept in water and periodically examined. One pustule containing innumerable spores was found on a scabby area on the bark, but no others have since been discovered. The evidence is, therefore, very slight, but this is probably the method by which the disease persists from year to year as many fungi (*e.g.* the Black Spot fungus on Roses), are known to attack leaves and shoots during summer, and to spend the winter in diseased places in the tissues of the bark.

Only two records of the disease in Great Britain have so far been received, but it will be as well if it is recognized at the outset and measures taken to eliminate it. Such measures should take the form of picking off and burning any leaves showing the pustules, and spraying with Bordeaux mixture to prevent successful germination of free spores. Soil conditions and drainage should be made suitable, so that the plants can grow healthy and vigorous foliage.

LEWISIAS AT CAMLA.

BY F. W. MILLARD, V.M.H.

FOR many years rumours of the beauty of the *Lewisias* had reached me and although repeated attempts were made I despaired of ever acquiring any. Then, I believe it was in the spring of the year 1913, a specimen was sent to me, and it was named *L. Howellii*. It possessed a small rosette, scarcely three inches across, and showed signs of being alive. How well I remember trudging round my garden, then on the extreme west coast of Ireland, seeking a suitable spot to plant it, for nothing had been told me regarding its requirements, as to aspect and soil. Finally, I got it in, and was charmed to see how quickly it revived and started to grow. My first success may have been due to the fact that I planted it on the nearest point in Ireland to its home, for only the Atlantic lay between it and America! Do plants cherish sentiment?

One day, soon after, the astonishing news was brought to me that this *Lewisia* was throwing up a spray which promised bloom, and blooms eventually developed, very poor and small, and conveying little idea of what the plant is capable. We were not entranced with it, but it is a mistake to condemn any plant at its first attempt to bloom in an alien country; it is wiser to "wait and see."

Fortunately, the small spray of bloom set seeds, about nine in all, and these were carefully sown. They duly germinated and the seedlings grew away like the proverbial bay tree, and soon developed into specimens far exceeding their parent in size and vigour. Their improvement has continued with each successive sowing, and in this garden at least they have become so acclimatized that they spring up in every direction and in all sorts of places and soils, proving that *Lewisias* are not at all fastidious. Such success is not possible with the imported roots too often offered at nurseries.

Many people complain to me that they do not get on with *Lewisias*, and there are reasons for this. First of all, these plants are not lovers of lime; they consent to endure it in moderation when there is plenty of humus in the soil, but too often live on in a condition of stagnation, developing only a small rosette, and a poor quality bloom. They thrive well in a peaty, leafy, sandy soil, but to ascertain what they can do plant them in a moraine consisting of sandstone broken to the size of the tips of the fingers, and peat and leaf-mould. The mixture should consist of half stone, and the other half equal proportions of peat, leaf-mould, and sand. If the moraine mixture is nine inches deep that is sufficient, and by no means trouble about supplying underground water. You had better plant well apart, for the rosettes are likely to reach a foot across, and I have counted three hundred sprays of bloom on one.

Many who attempt to grow *Lewisia*s fall into the error of over-watering, and failure follows because of this. The plant to a certain extent is a succulent, capable of enduring much dryness, but cannot withstand quite the treatment meted out to the Cactus family. Extreme dryness it resents, also too much moisture, and the happy medium should be struck. The *Lewisia* possesses a fleshy root very liable to decay. Neither in moraine nor soil do I cover all my *Lewisia*s with glass in winter, for they come through the worst of conditions safely without it. Delicate ones I may shelter from rain.

Some alpine enthusiasts would sacrifice a good deal to grow *Lewisia rediviva* to perfection, and yet this is very simple. It is a lovely thing with its big silky blossoms, of which I have had a dozen open at one time on a single plant. I have succeeded in obtaining white, deep pink, and rich red varieties, some having exceedingly large blooms. This plant does its best in a compost consisting of river grit two-thirds, and leaf-mould one third, either in an alpine house or in the open. When the leaves have disappeared and the blooms are over, the roots should be kept bone dry and placed on a shelf in full sun. Towards November there will be signs of growth, and from then on till they go out of flower moisture must not be denied them. *L. rediviva* sets seed freely, and plants produced from it far excel those imported. Sow in a mixture similar to that described, and duly prick out well apart. Bloom should follow the second season. Exactly the same treatment after flowering is advisable for all *Lewisia*s which die down, such as *oppositifolia*, *Leeana*, and *nevadensis*. *L. Tweedyi* (fig. 37) thrives best in a peaty soil when in the open garden, and requires a pane of glass to throw off winter rains. This plant is not long-lived, generally giving a superb display and then fading away.

Few know that *Lewisia*s can be grown from the leaves, tearing them off with a shank, and treating them as you would the leaf of a *Ramondia*. It is a slow process, but almost the only way of increasing a hybrid with a certainty of developing the true thing. A few do develop several crowns, especially *L. columbiana rosea* (fig. 39), and these may be safely divided and potted up singly. Even if a division has no roots these will come. *Lewisia*s when brought into association hybridize shamelessly, and it is almost impossible under such circumstances to keep any variety true. However, all the hybrids I have seen have the merit of being very lovely, and if possible more vigorous than their parents.

No plant has ever with me responded to the camel-hair pencil as have the *Lewisia*s. I have succeeded in obtaining rich deep carmines, lovely pinks, and several intermediate shades, and, strange to say, many are self-coloured, all signs of the stripe having been eliminated. These plants have been a wonder to all who have seen them, and what the future may bring forth remains to be seen.

When I first attempted *Lewisia*s I did not imagine they would ever become easy plants, but to get it to this stage has been the work of over twenty years. It has proved so submissive that I am encouraged to proceed on the same lines with other plants accounted difficult.

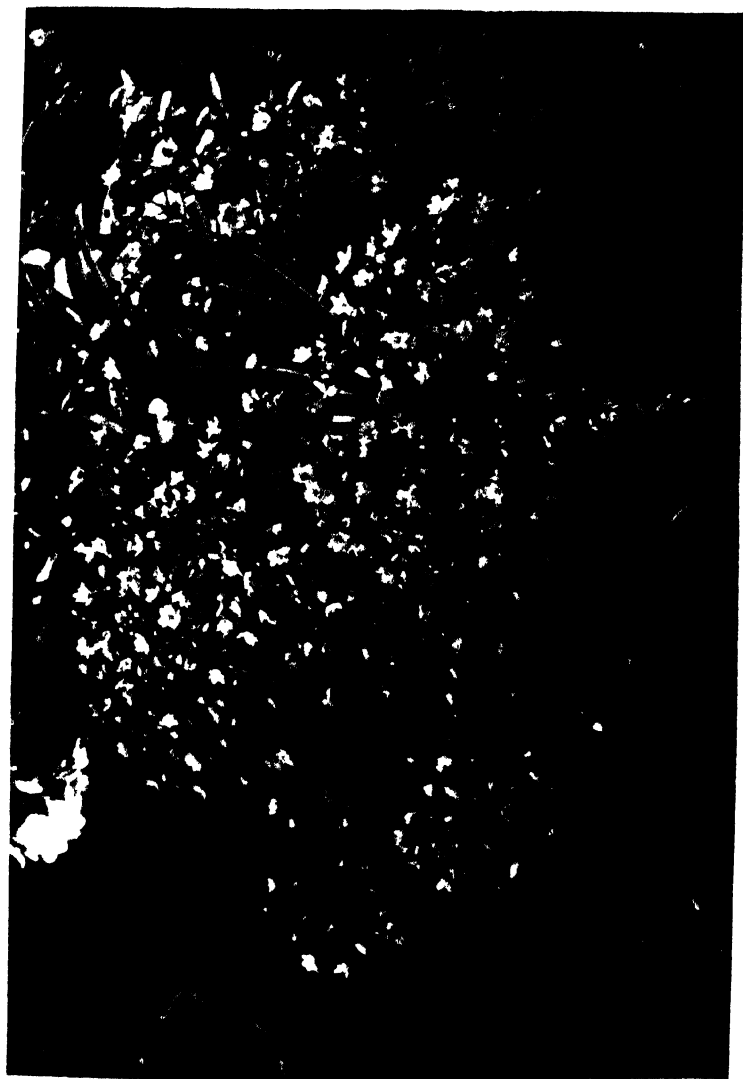


FIG. 39.—LEWISIA COLUMBIANA.



FIG 40 ---LEWISIA PYGMAEA (enlarged).

Sad to say, when any plant proves this it is at once thought to require protection, and if that is extended it is an end to its acclimatization. I am now at work on *Aquilegia Jonesii*, the most beautiful of all this large family. Many *Aquilegias* have been shown under this name, but none true. The true plant throws up its blooms before there is a sign of leafage appearing. These are quite single and of a lovely pale blue, staring one in the face; in fact they resemble an anemone, although no anemone I have seen is as beautiful. When the leaves appear they comprise a tuft indescribably attractive. Sometimes, a few blooms appear with and above the leafage, and then they are a sight for the gods. A peaty soil with shade from the midday sun seem to be all this plant needs, and I do not think it will ever be in love with alpine-house treatment. It is a denizen of the coldest and most exposed spots, and all too rare in Nature.

One of the pioneers of *Lewisia*-growing was Mr. WALPOLE, of Mt. Usher, Co. Wicklow, where I saw the first really fine specimen. It was growing on a rockery bank of the river Vartry, in a compost largely consisting of river grit. I remember lingering by the plant till I nearly exasperated my kindly host, who had so much to show me. Strange to say, Mr. WALPOLE now tells me that he does not succeed with *Lewisias*, although almost every other plant grows to perfection in that wonderful Irish garden. Later on I hope to describe many reputedly new *Lewisias* which have come to Camla Gardens from America, but these have yet to be proved. From what I learn I am convinced that we are yet only touching the fringe of this family, and that many species strange to us have yet to come.

SUCCULENTS OTHER THAN CACTI.

BY C. DENNIS O'DONOGHUE, F.R.H.S.

[Read July 24, 1934; W. PETTIGREW, Esq., V.M.H., in the Chair.]

THE title of this lecture embraces such a huge number of Families and Genera that the mere enumeration of them with the fewest possible descriptive words added would take up more than the whole time of a single lecture, and would serve no useful purpose.

It seems more profitable to consider some of the newer introductions, especially with regard to the remarkable discoveries made in South Africa during the last few years.

Most individuals will, without hesitation, claim to be able to tell a Succulent at first sight. "It is a plant with very thick leaves which hold a lot of water." If this were a correct definition then a Cabbage or a Lettuce could be succulent plants, which clearly they are not. A piece of *Sedum* and a spray of *Samphire* look closely akin and it would be excusable for the uninformed to class both as Succulents. If, however, a detached piece of each is exposed in a dry sunny place for a few days the *Sedum* will have changed but little, whilst the *Samphire* will have withered completely. Clearly then a Succulent besides absorbing water in large quantities must have the capacity for *storing it indefinitely*. But the Onion, the Turnip, and many plants beside, both collect and store water indefinitely. In order then to define a Succulent something further is necessary. By adding the words "and are able to withstand arid and torrid conditions indefinitely without deteriorating," our concept of a Succulent becomes clearer. This, however, will not exclude many Orchids. In every sense of the word many Orchids are true Succulents. Why they are not cultivated with Succulents will be dealt with later, though many old collections of Succulents included Orchids. A further narrowing down of the definition would be secured by adding something about all the aerial portions—stem, leaves and flowers—being able to stand, without damage, complete severance from the root and then to form fresh roots near the ground even under exposure to the hottest and driest of climates.

The line of demarcation between Succulents and mere Xerophytes is, indeed, a very thin one, and when dealing with a family where most of the species are unquestionably succulent it is sometimes impossible to say whether a certain species is truly succulent or not. For instance, though *Euphorbia Hisloppii*, *E. splendens* and *E. Bogeri* are so frequently grown in a collection of Succulents their position as Succulents is open to question. Most cultivators gladly give them the benefit of the doubt to the great enrichment of their stock of plants.

Most cultivators who specialize in growing succulent plants admire them for their bizarre appearance, their bold curves, their rigid aspect, their charming coloration, their awe-inspiring spines, their marvellous adaptive contrivances, and their generally uncommon, out of the ordinary effects. Besides which it is undoubtedly an attraction to have something *different*, something which very few others possess.

The Succulents do not form a world of their own or a world apart. In many families there is an infinity of gradation from succulent to nearly-succulent, and thence to the ordinary flat-leaved plant. Benefit of the doubt is commonly given to most of the near-succulent type and many other plants are, by convention, included in collections if they conform by their fleshy appearance, their bold curves, their spininess, their hard dry coloration or by a rosulate habit to the general *appearance* of a Succulent. In any case they must conform with the general cultural treatment of the collection. The Orchid does not generally conform in appearance with this ideal and hence is usually excluded. In the long run convention, long-established custom, and, sometimes, the dealer's pictorial catalogue, is the deciding factor. This is not very scientific perhaps, but it is not possible to give a strictly scientific definition of Succulent—it is merely a term of convenience.

Succulence cannot be regarded merely as a question of foliage. It may also exist elsewhere, as in the Cape bulbs of the genus *Haemanthus*.

The cause of succulence has been variously attributed to the presence of salts or of acids in the cells. Again, high osmotic pressure in the cells has been ascribed as the cause. Recent researches, however, have proved that this is not the case, but that it is really due to the ability of the plant to form *pentosans* which substances are known in their common forms as mucilages and gums. Pentosans have the double qualities of being able to absorb large quantities of water rapidly and hold it firmly. These properties will explain why any injury to the skin of Succulents is prone to set up rot unless the surface of the wound is rapidly dried and callused over. An undried open wound offers an ideal culture bed to all kinds of rot fungus spores. It is also a warning to have the plants thoroughly ripened and hardened before the advent of winter, otherwise they will be too flaccid to stand up to our months of rain, fog and humid atmosphere. A further cultural hint may be given and that is, to defer the first spring watering until the days are warm enough and light enough to start growing on continuously. Succulents will be all right kept dry, but premature watering will only dilute the gums and render a plant more feeble rather than put fresh vigour into it. The pectin, which causes jams and jellies to set firm, is largely composed of pentosans. It might help us in cultivation to think of Succulents in terms of blobs of jelly that want keeping hard and firm.

One frequent exhibitor in our Hall plants largely with the base of the plant in a raised collar. This seems a good practice. One common fault with old plants is that they rot off just at the soil level. This is

unquestionably because the thick and old portion is not properly ripened. The raised collar keeps the enclosed soil much drier, hence there is more effective ripening and less chance of rot. The more active roots can find moisture and extended root run in the portion below.

A further warning may be found in the fact that *Yuccas*, *Agaves* and some other plants contain a saponifying substance as a provision for the conservation of moisture instead of pentosans. Injudicious watering of these may result in turning good soap into harmful lather ! Indeed, it is stated that roots of *Nolinia Palmeri* are made to serve as an amole.

The exterior structural modification of growth to meet arid conditions gives rise to the multitude of unusual and what we may term strange forms of growth. Frequently leaves are dispensed with altogether and sometimes their vestiges are bundled together and become spines and so a spiny stem is arrived at. Many stems of Succulents are not covered with an opaque bark but contain cells with the life-giving chlorophyll grains which are usually found inside the leaf. The cylindrical formation gives a large mass for a comparatively small surface and thus the area of transpiration is greatly reduced and the sun's rays have less surface to act on.

The greatest volume for the smallest covering is found in the sphere. This object has been successfully attained in the case of *Muiria Hortenseae* (fig. 41). It is a native of the Little Karoo in South Africa, and was discovered by Dr. MUIR. The sensation it made when introduced in 1927 can hardly be realized by the ordinary layman. It is a plant consisting of two leaves which are united into one mass save for a minute opening towards the top which often cannot be discovered even by the expert. When it flowers the bud pushes its way through the general mass of the plant, bursts the skin and pushes its way outside. The cell structure is most exceptional, and Dr. N. E. BROWN has given an entrancing account of it. Most of the cells are about one-eighth of an inch in diameter and can be readily separated from one another. Their drought-resisting properties even in this condition are perfectly wonderful. Dr. BROWN placed some separated cells on his chimney-piece ; part were on glass and part were on paper, and by their side was placed a saucer half filled with water. By the end of the second day the saucer was completely dry, but the cells remained fresh and sparkling like dew-drops till the end of the ninth day. At the end of the fourteenth day a single cell still remained fresh, the others having dried up or shrivelled somewhat. It was not until the end of the eighteenth day that this survivor collapsed. Truly *Muiria Hortenseae* is a marvellous plant whose drought-resisting capabilities are only equalled by its impatience of having too much to drink.

In many ways *Pachyphytum oviforme* (fig. 42) is a typical Succulent plant, and well provided for its life's work and will serve to illustrate many, though not all, of the protective devices to resist drought. The stem acts with the leaves. The leaves are reduced in number and



FIG. 41. *MURIA HORTENSEAE*

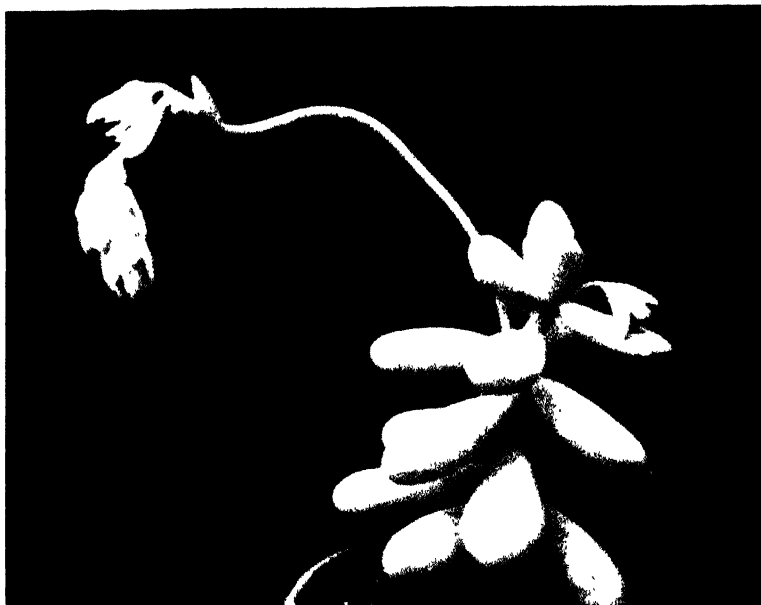


FIG. 42 — *PACHYPHYTUM OVIFORME*



FIG. 43 — VEGETATION OF THE KAROO

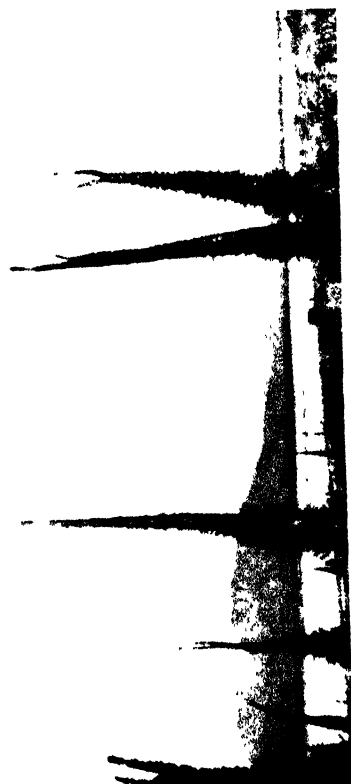


Fig. 44 IDRIA COTUMNARI



FIG. 45 - AGAVE BRANDEGEI IN
CALIFORNIA

†To face p. 165

increased in bulk. The stomata are few and deeply sunk below the surface. The glossy skin has a strengthening and protecting covering of cutin which is overlaid with a "bloom" or waxy covering which still further reduces transpiration.

These are not the whole armoury of the Succulent kingdom and others will be indicated with reference to particular plants as they are mentioned.

The habitat of these plants is popularly thought to be the desert, and it is freely held that they grow where nothing else will grow. In point of fact neither supposition is strictly true. Some grow on rock surfaces or sprawl on rocky coastal ledges, many live in arid inland districts, others live in moist semi-tropical regions. There is one little oddity, *Rhopalota aphylla*, which though a true Succulent grows at a depth of 6 inches *under water*. It has the appearance of a large green raisin "pip." This plant was recently to be seen at Kew, where the pot in which it was growing was kept standing in a bowl of water. In the mountains where the plant is at home the summer's sun dries the pools up and then it conforms to the Succulent requirement of having to withstand periods of prolonged drought without detriment. It is a most amazing thing that this plant has so evolved that it passes part of its life as an aquatic, whereas the common characteristic of a Succulent is that it is highly impatient of an excess of water at any time.

Succulents are not the only plants which are desert dwellers. The Karoo of South Africa is noted for the number and variety of its Succulent growths but they only make up one-third of the total vegetation. There are thorny switch-like plants, tuberous plants and annuals all in great variety which magically spring into growth after the first shower, be it ever so slight. The harsh and stiff plants do not produce pentosans but survive by producing an excessive amount of cellulose and woody materials—another method of dodging arid conditions.

Here is an extract from a letter written by Mrs. VAN DER BIJL who is a most enthusiastic collector and grower of these plants.

Writing at the close of 1933 she says :

"I had a wonderful trip to Namaqualand in October. We motored over 1,000 miles and could stop to take out plants where we wished. The only pity was the motor was so soon filled.

"The flowers were really wonderful—fields miles in extent, with Blues, Oranges, Yellows, Pinks and Whites, quite indescribable ; and to think that these parts *had not had rain since 1925!*"—a matter of some eight years.

In desert locations it is worth while noting the abundance and position of the rocks and also the great amount of vegetation growing usually in individual clumps.

The illustration (fig. 43) showing isolated clumps of many different species of flowering plants and coarse grasses will give an idea of the way in which the desert is peopled with these plants.

Idria columnaris (fig. 44) was photographed by Mr. HOWARD GATES, the well-known collector of Californian Cacti and Succulents. The plant is known as the "living telegraph pole," a name helped by the fact that the small branches with their clusters of leaves are always at the top of the growth, as with age the older branches cease activity, wither and drop off. The plant is quite rare and only a very few were known until Mr. GATES discovered this so-called "grove." A small specimen is frequently on view in our Hall. Small as it is it is so weighty that a man can lift it only with difficulty. Its spine formation is peculiar, being formed from the dry petiole of the leaf in a manner somewhat similar to that of its near relative the *Fouquieria* or 'Ocatillo' of the Andes. Purists do not regard these two plants as true Succulents. Why, it is hard to say.

Agave Brandegei (fig. 45) is from another of Mr. GATES' photographs. The genus *Agave* is well known in England under the name of 'Century Plant' and when one flowers at Kew at times the glass is removed to enable the flower to develop fully or when possible it is removed outside to flower—and then die, for seed-bearing terminates its life. The *Sempervivum* behaves in a similar manner. In each case basal plantlets are produced before the flowering. It is no use to try to prevent their flowering. The ferment is in their system and flower they will. Specimens last for years as noble ornaments on pillar tops, in vases or on hot stone terraces, positions for which they are eminently suited. The Californian laughingly says, "It is called the 'Century Plant' because it lives for ten years." Their life on the Riviera, where they are exceedingly common is about fifteen years. In England their life is quite an indefinite period, depending chiefly on the heat of the summers, but it is never anything like a hundred years.

These Agaves are all natives of the tropical or sub-tropical parts of America. *A. utahensis* and *A. Parryi* are hardy, and Cambridge Botanic Gardens have had specimens of each for a number of years growing outside on a slight mound under the shelter of a greenhouse wall.

Many of the species are highly decorative in a small state, and as the growth in England is very slow they make effective pot plants for a number of years.

A. Ferdinandi-Regis is a recent discovery and is very close to *A. Victoria-Reginae*.

The rosulate growth of these plants, so common amongst Succulents, may be noted. The point of the leaf is directed upwards so that only a small amount of leaf surface is in the direct sunlight and also the shadow of each leaf gives a certain amount of protection to its neighbour.

Yuccas are natives of America and are distributed from Dakota southwards to Mexico, and eastwards to the Atlantic coast. *Yucca filamentosa* flowers early in the year and begins flowering whilst quite small. *Y. gloriosa* is much more common in gardens, but its flowers are frequently cut off by the frost owing to its late flowering. Both

species are fairly hardy, but in severe winters the heart of the plant is often tied up to exclude frozen water and snow.

Y. aloifolia variegata is a smaller growing plant and is often grown inside greenhouses for its decorative effect. It "mixes well" with many types of growth.

This genus is one of the large order Liliaceae.

Echeveria crenulata (fig. 46) introduces the great Order Crassulaceae which includes many diverse, and all truly beautiful, Succulent genera. It is divided into numerous families and sub-families. The "Splitters" are all out for making a multiplicity of fine distinctions. The "Lumpers" try to close things up and try to prevent unwieldiness, and make classification really useful and not a puzzle for botanists alone.

For convenience the Echeverias and Cotyledons may be lumped, though the Echeverias hail from Mexico and the Cotyledons from South Africa. The flowers are very similar, but the Echeverias have the advantage in brightness, elegance and freedom of bloom, whilst the Cotyledons have the advantage in most striking contrasts between the petals and foliage.

Recent discoveries in California are bringing in new species of Dudleya. The flowers are very similar to the Echeverias, but the plants are covered with a thick white bloom and make objects of striking beauty. Specimens of these are often exhibited in the Hall.

Another genus of the great order Liliaceae whose chief centre is South Africa is Aloe. The species range upwards from the Cape through tropical Africa to Nubia and Abyssinia.

All flower freely, and given a little heat grow readily. In the south of Europe many luxuriate in the open as they do also in California.

Some of the smaller species make very pleasing plants such as *Aloe aristata*, *A. humilis*, and the old favourite *A. variegata*, often known as the 'Partridge-breasted Aloe.' A new discovery very similar to this is *A. Aussana*. It is said to be quicker growing and hardier than *A. variegata*. Its leaves are bolder and thicker. There are several Aloe-Gasteria hybrids which are much prized—*A. Nowatni*, *A. Beguinii* and *A. Quehlii*.

The real solution of the means by which desert life is sustained, even though no rain may fall for years, is found in the fact that all deserts are very cold at night owing to the rapid radiation of heat from the stony or sandy surface into the cloudless skies. Such moisture as there is in the air, and there always is some, is rapidly condensed into dew which in some cases penetrates to a considerable depth. A plant which is once established sends out a network of roots all round not far from the surface. This explains the formation of clumps of vegetation. Each Karoo or desert supports as much vegetation as the dew formation of that district will afford. Treelike forms are almost invariably found in very stony ground or by the side of huge masses

of isolated rocks. In Californian deserts even tender ferns are found nestling by the side of huge rocks from whom they derive their moisture in the form of condensed dew.

Haworthia is an interesting genus early separated out from the Aloes. The species can be grown in a greenhouse from which the frost is excluded, if kept quite dry in winter. A temperature of 40°–50° F. is more suitable, as it is also for Aloes, but if 50°–60° F. can be maintained they will never lack vigour. Water is their chief enemy, especially if not making growth. When planted out at the Cape it is suggested they may be watered three or four times during the season if the summer is a dry one! Burnt clay is a very safe, clean and suitable "compost" to use for them as well as for Aloes and many tender-rooted species. It is well drained yet never gets bone dry, and the clay is not so cold to the roots as a denser medium would be. Examples frequently shown in the Hall demonstrate that it is sufficiently nourishing to support vigorous growth of all kinds. Plunging in water is the best and quickest method of watering this "compost." In any case soil for Succulents must be very open and well drained.

There is no genus of plants which shows so many different types of foliage as this. The species may all be accommodated in quite small pots and a representative collection is very pleasing. The flowers are not striking and there are only minute differences between them despite the enormous diversity of the foliage.

Up to the year 1900 there were but about sixty-five species known and it seemed as if finality had been reached. Now, however, the motor-car has been called into service by plant collectors and there is a constant stream of new species sent over by Mrs. VAN DER BIJL and others. Since 1929 at least thirty species have been named and described. Many others have been received and still await naming or identification. A group of these plants richly rewards careful inspection, and the more they are studied the more fascinating they become. Despite their size and obviousness in the pot they are most difficult to find in their native habitat.

The leaves of *Haworthia viscosa* are not only evergreen but are practically ever-living. Besides the desert adaptations previously noticed this plant has another one. In very hot weather the leaves become coated with a moist viscous mantle (hence the name). When the wind blows grains of fine sand adhere most firmly to the leaves. This may be a protection from the sun or it may have some purpose regarding condensation, but there it is. In a genus of the Mesembryanthemums, *Psammophora*, the leaves are so covered with sand grains that a detached leaf, even in the hand, looks exactly like a sandstone pebble.

In *H. cuspidata* (fig. 47) one may notice streaks at the end of the leaves. These are really "windows" to admit light which is excluded by the other parts of the leaf. This is yet another desert adaptation. This really beautiful plant likes some shade and normally grows at the foot of sheltering bushes.



FIG. 46 ECHEVERIA CRENUATA



FIG. 47 HAWORTHIA CUSPIDATA



FIG. 48 HAWORTHIA TRUNCATA

[To face p. 169.

Yet another type of *Haworthia*, represented by *H. Bolusii*, is clothed more or less densely with hairs or bristles. Dr. BROWN surmises that they may serve the purpose of absorbing moisture, but this has not been proved.

H. sordida is fitly described by the name, for it is hard, dull, slow growing and ungracious looking, in great contrast to the preceding. It is extremely rare in cultivation which may perhaps be explained by the difficulty of finding it in the wild.

H. Reinwardtii is one of the tall-growing group and plentifully decorated with white pearls.

H. limifolia is a unique type and very scarce. It is a privilege to have even seen a plant. The skin is puckered up into ridges just like ripples of sand on the seashore.

H. fasciata is an outstanding species. The backs of the leaves are decorated with raised bands of bold white markings.

H. attenuata, not so very attenuate despite its name, is distinct from the last by the bands on the leaf being more broken and not so large.

H. truncata (fig. 48) is an exceedingly remarkable species, very rare and unique, for it is the only plant in the genus which has its leaves arranged bilaterally. The leaves are truncate and the truncate tips are colourless and transparent as glass. The surface is covered with papillae whose function is to diffuse the sun's rays—another desert adaptation. During the hot weather on the Karoo the thick roots begin to get dry and then wrinkle up. In so doing they pull the plant bodily down into the soil until the "windowed" tips alone are exposed above the soil and so they snugly pass the summer just peeping out into the sunlight. Yet another desert adaptation. This plant is the most perfect example of a fenestrate or "windowed" plant.

Recently another somewhat similar fenestrate plant has been discovered, *H. Maughanii*, but this plant is rosulate in growth and the leaf is almost circular in cross-section.

Like so many of the weird South African growths these two species occur in a single locality and the export of both species is now most strictly prohibited.

In cultivation these plants grow more normally. Our climate is too humid to allow of their being grown buried. An attempt to do so would result in the plant rotting.

It should be borne in mind that the Karoo is not a stuffy place by any means, hence none of these plants will tolerate a greenhouse which is kept stuffy. Free ventilation is essential.

[The lecturer showed a very large number of slides illustrating many genera of other families including the great group of Mesembryanthemums, and concluded:]

Endeavour has now been made to envisage desert conditions, desert vegetation and its source of water supply, how Succulents are

adapted both internally and externally to meet the combined extremes of great heat and great drought, illustrated by a few examples of characteristic plants from both America and South Africa.

Grateful acknowledgments are offered to the following who have kindly assisted by so readily and generously supplying pictures for illustration :—

Dr. N. E. BROWN, of Kew ; R. A. DYER, Esq., Pretoria ; J. R. BROWN, Esq., Pasadena, California, who also included several photos from HOWARD E. GATES, the Californian explorer and collector ; Mrs. WHITE, of Fulham ; and to the Cactus Journal (U.S.A.), and the Desert Life, both of California ; and also to Dr. C. H. O'DONOGHUE, Edinburgh, who rendered great assistance in making the slides.

THE ORIGIN OF THE PINK-FLOWERED CHESTNUT, *AESCULUS* \times *CARNEA*.

By M. B. CRANE, The John Innes Horticultural Institution.

ALTHOUGH nothing appears to be known with certainty as to when or where the pink-flowered chestnut *Aesculus* \times *carnea* originated, it is generally agreed that it has arisen from hybridization between two species of distinct sections of the genus, namely the common horse chestnut, *A. Hippocastanum* from Eurasia, which makes a large tree up to 100 feet high, and *A. Pavia* from North America, a comparatively small shrubby species which only attains a height of about 12 feet. It seems probable that *A. x carnea* arose as a chance hybrid in the eighteenth or very early nineteenth century, and that it had attained considerable age and size before its attractive characters were brought to general notice. Referring to a tree with characters intermediate between those of *A. Hippocastanum* and the Red Chestnut *A. rubicunda*, BURBIDGE (1876) states: "This curious tree came from a seed of the Red Chestnut, sown about 1843." This cannot, however, refer to *A. x carnea*, for in Edwards' Botanical Register as early as 1827 there is a coloured plate of an inflorescence of *A. x carnea* accompanied by the following description: "One of the most beautiful of all our hardy trees, resembling the common Horse-chestnut in general appearance, but being smaller, and bearing a profusion of fine bunches of rich flesh-coloured flowers. Its native country is unknown. Our drawing was made in the garden of the Horticultural Society in June 1826."

In addition to wide differences in habit and height, several other well-marked characters separate *A. Hippocastanum* from *A. Pavia*. For example, the fruits of the former are very spiny and the flowers usually have five petals with a patch of colour confined to the base. In *A. Pavia*, however, the fruits are smooth and the flowers only have four petals which in contrast to those of *A. Hippocastanum* are richly coloured and are glandular at the margins. These widely contrasting characters formerly constituted the generic difference between *Aesculus* and *Pavia*.

A. x carnea is in many respects intermediate between the above two species; it makes a tree 50 to 70 feet high and its fruits are slightly spiny. In general habit of growth and foliage it resembles *A. Hippocastanum*, whilst in the colour of its flowers and the glandular-edged petals it approaches *A. Pavia*. In regard to its flowers *A. x carnea* is one of the most ornamental of the genus, and in consequence it is frequently found in gardens where space permits large trees to be grown.

Although generally accepted as a hybrid, *A. x carnea* is usually propagated by sexual means and it has aroused considerable interest, both among horticulturists and biologists, first by its fertility and

secondly by its behaviour in breeding approximately true from seed. Thus BEAN (1914) states: "Some half a dozen plants were raised from seed at Kew, about 1896, which are now some 20 feet high, and have flowered for several years past. They do not differ in any respect from ordinary *A. carnea*, or from each other, except in the depth of colour in the flowers. This is rather unusual in the progeny of a hybrid." More recently HURST (1932), states that of 218 seedlings he raised, only slight variations in the amount of yellow at the base of the flowers and other minor differences were evident.

In hybrids from widely distinct parents we are perhaps more familiar with the occurrence of sterility than fertility, and when hybrids are fertile considerable diversity in the progeny and some approach to the parental forms is a common expectation. But during the last decade genetical and cytological research has shown that to expect a distant hybrid always to be highly infertile and to assume that its parental types will inevitably appear in the second generation is taking too simple a view of the potentialities of interspecific hybridization. In this connexion the recent studies of the chromosomes of *A. × carnea* and its parental species *A. Hippocastanum* and *A. Pavia* by SKOVSTED (1929) are of exceptional interest. SKOVSTED found that both *A. Hippocastanum* and *A. Pavia* have twenty pairs of chromosomes and the hybrid *A. × carnea* forty pairs. The chromosomes of *A. × carnea* have therefore doubled in number, and thus given rise to a constant true-breeding new species in which the characters of the two sections of the genus are combined. Of further interest is SKOVSTED's observation that *A. Pavia* has twenty large chromosomes and *A. Hippocastanum* twenty small ones in the germ-cells, while the hybrid has twenty large and twenty small (see fig. 51). This enables the chromosome complement of both parents to be identified, and has clearly established the hybrid origin of *A. × carnea*. It has also afforded an explanation of its genetic behaviour.

How the doubling of the chromosomes occurred in *A. × carnea* is not known, but we are familiar with two methods by which such duplication not infrequently arises. One is by unreduced germ-cells taking part in fertilization, whereby pairs of all the chromosomes are transmitted. (Normally one only of each pair is transmitted as a result of the process of chromosome reduction which precedes germ-cell formation.) The other method is by chromosome doubling in the somatic or body cells of the plant. For example, in the case of the species-hybrid *Primula × kewensis*, the original hybrid plant was a highly sterile diploid with 18 chromosomes, but subsequently a tetraploid branch arose, with 36 chromosomes, which in contrast to the diploid branches was fertile.

The restoration of fertility following chromosome duplication is becoming a well-known phenomenon and is of wide practical interest. In species-hybrids sterility frequently results from an odd multiple chromosome complement, or from too great a dissimilarity of the parental chromosomes. This prevents normal chromosome pairing,

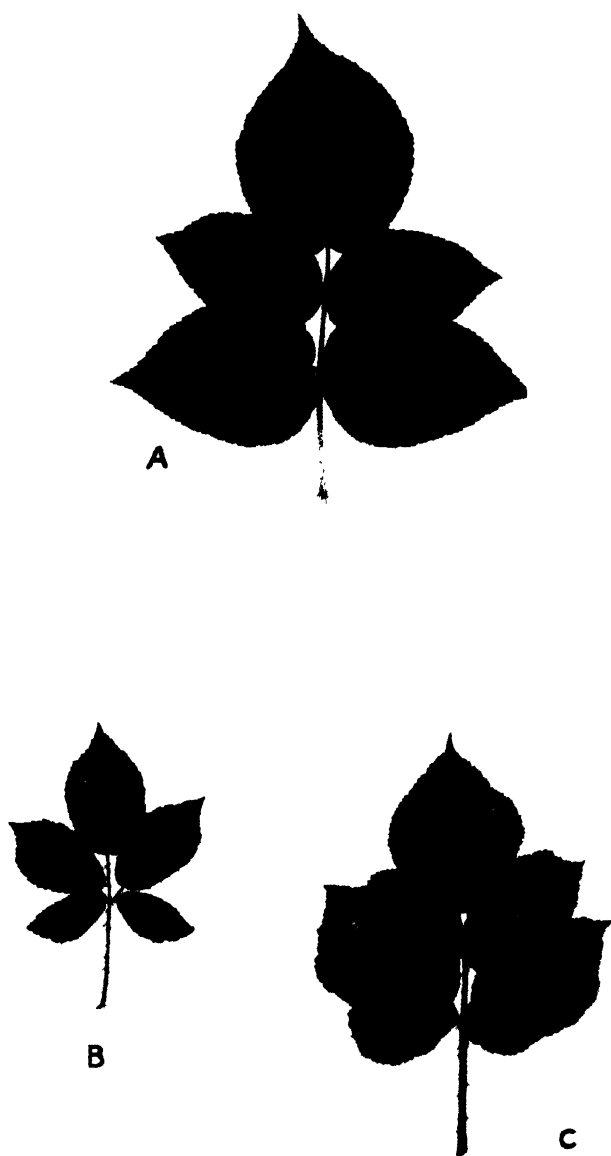


FIG. 49. INTERSPECIFIC HYBRIDS IN RUBI.
A, Raspberry. B, *Rubus rusticanus*. C, Veitchberry.



FIG. 50 - *ACINETA SUPERBA*.

[To face p. 173]

and sterility is inevitable, but when chromosome duplication occurs as in *A. × carnea* and the tetraploid *Primula × kewensis* each chromosome is provided with an identical mate with which it can pair, and fertility is thereby restored.

The genetic behaviour of a duplicated species-hybrid such as *A. × carnea* depends upon the type of chromosome pairing. If we designate the chromosome complement of *A. × carnea* as HHPP, HH representing the *Hippocastanum* and PP the *Pavia* complements, and assume the H chromosomes pair with H and the P with P (autosomesynesis), the result will be that all the germ-cells will be of the constitution HP and the chromosome complex of *A. × carnea*, HHPP, will be restored at fertiliza-

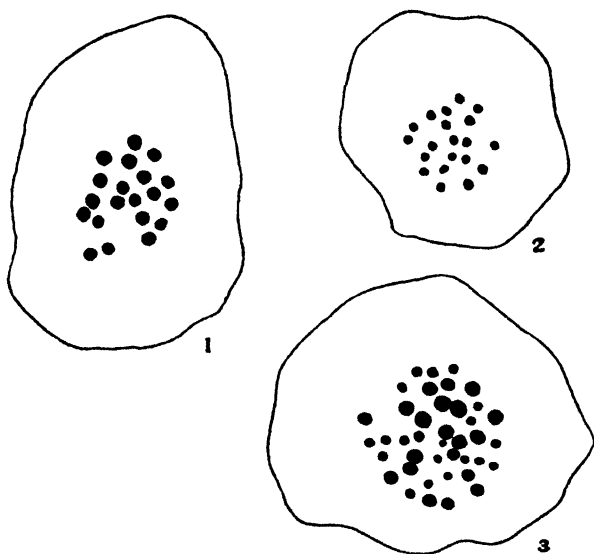


FIG. 51.—1, CHROMOSOMES OF AESCULUS PAVIA; 2, OF *A. Hippocastanum*; 3, OF THE HYBRID *A. × carnea* (after Skovsted).

tion.* On the other hand if what is known as allosyndetic pairing occurred, some of the germ-cells would be HH, some PP and duplicated parental types such as HHHH and PPPP would reappear in the second generation as well as HHPP types which constitute *A. × carnea*. As we have seen, however, *A. × carnea* breeds practically true and the parental types do not reappear, therefore it must be assumed that the effective germ-cells are those arising from autosyndesis, and it is probable that the minor variations which have been observed in its progeny are mainly due to an original heterozygous condition of one or other or of both parents. Thus considering the taxonomic, cytological, and genetical results the evidence clearly confirms the inter-specific origin of *A. × carnea*.

To the student of genetics the occurrence of relatively true breeding, or what we may call constant hybrids, such as *A. × carnea*, are of excep-

* H pairs with H and P with P, but at germ-cell formation they separate to form gametes of the constitution HP.

tional interest, as they provide examples of one of the methods by which new species may arise. They are also of importance to the horticulturist, as many valuable forms of garden plants, several of which have been accorded specific rank, originated in a similar way. To mention but a few, the Loganberry (*Rubus loganobaccus* BAILEY) and the Veitchberry are examples which have occurred in our own time. The latter is a tetraploid which like *A. × carnea* breeds approximately true, and which arose from crossing the raspberry 'November Abundance' with the hedgerow blackberry *Rubus rusticanus* (see fig. 49). In the raspberries the leaves are pinnate and in the blackberries they are palmate. In the Veitchberry these fundamental specific characters are combined, fully developed leaves being partly palmate and partly pinnate (CRANE and LAWRENCE, 1934). The fertile, relatively true-breeding and tetraploid form of *Primula kewensis*, which arose from hybridization between *Primula floribunda* and *P. verticillata* (NEWTON and PELLEW, 1929) is a classical example of how hybridization and chromosome duplication have given rise to a new form. There is a good deal of evidence which indicates that our garden plums, *Prunus domestica*, have originated from hybridization between *Prunus divaricata* and *Prunus spinosa* accompanied by chromosome doubling (CRANE and LAWRENCE, 1934). *Prunus divaricata* is a diploid species with 16 chromosomes. *Prunus spinosa* is a tetraploid species with 32 and *Prunus domestica* is a hexaploid species with 48 chromosomes. Although the problem is here a little more involved the garden dahlia, *Dahlia variabilis*, provides a similar example of the origin of a species (LAWRENCE, 1932) which is of outstanding horticultural value.

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PLANTS TO WHICH AWARDS HAVE BEEN MADE.

Berberis hypokerina. A.M. On June 7, 1932, the Award of Merit was given to a *Berberis* which was stated by the exhibitor to have been raised from seed sent by Kingdon Ward under his number 6308, and the plant was described in the JOURNAL, vol. 58, p. xxxi, as *B. Hookeri glauca*. This name was incorrect. The plant which received the award was *B. hypokerina*, the number under which it should have been shown, K.W. 6787.

Cattleya × '**Remy Chollet**' var. '**Our Prince.**' A.M. February 19, 1935. From Messrs. Sanders, St. Albans. '**Monarch**' × *Trianae*. Flowers much above the usual size, light rose sepals and petals, deep-purple labellum.

Clematis macropetala Markham's Pink. A.M. March 5, 1935. From Wm. Robinson, Esq., East Grinstead. *C. macropetala* is a slender, deciduous climber introduced from Kansu twenty years ago by Farrer. The leaves are three to six inches long, biternate and coarsely toothed. The solitary flowers have four or five narrow, spreading sepals enclosing a central tuft of whitish, petal-like segments. The colour is normally light blue-violet, but in the variety it is a pleasing shade of rose, suffused with purple at the base of the flower.

Cymbidium × '**Aphrodite.**' A.M. March 5, 1935. From E. Kenneth Wilson, Esq., 'Cannizaro,' Wimbledon. (*C.* × '**Redstart**' × *C.* × '**Flamingo.**') Spike of six white flowers with slight blush shading, labellum heavily marked with purplish-red.

Cymbidium × '**Corisande.**' A.M. March 5, 1935. From Lionel de Rothschild, Esq., Exbury. (*C. insigne* × *C.* × '**Rosanna.**') Spike of 8 flowers, deep blush, shaded with light pink, labellum much marked with rose-red.

Cymbidium × '**Eve.**' A.M. March 5, 1935. From Messrs. H. G. Alexander, Tetbury. (*C.* × '**Rosanna**' × *C.* × '**Flamingo.**') Spike of 3 flowers; the broadly-formed sepals and petals are blush-white, while the labellum bears rose-red markings.

Cymbidium × '**Jungfrau**' var. '**Snow Queen.**' A.M. March 5, 1935. From Messrs. H. G. Alexander. (*C.* × *Alexanderi* × *C.* × '**Eagle.**') Spike of 10 unusually large flowers, which are white, except for some purplish spotting on the lip.

Cymbidium × '**Midas**' var. '**Opal.**' A.M. March 5, 1935. From Messrs. McBean, Cooksbridge. (*C. Pauwelsii* × *C.* × '**Miranda.**') The plant bore a couple of arching spikes with a total of 28 flowers, of amber-green colour, the labellum marked with reddish-brown.

Fritillaria Karelinii. A.M. February 19, 1935. From Lt.-Col. C. H. Grey, Hocker Edge Gardens, Cranbrook. A small but charming bulbous plant hardy enough to be grown outside but very suitable for the alpine house. The stem is 4 to 6 inches high, bearing a few

somewhat fleshy, grey-green, lanceolate leaves and (in the specimens exhibited) one to four widely-expanded flowers. The perianth segments are oblong and obtuse, pale lilac-pink lightly spotted with green externally. In the wild state this species occurs over a wide area from the Ural Mountains in the North to Persia and Afghanistan in the South.

Gladiolus gracilis. A.M. March 5, 1935. From T. T. Barnard, Esq., Wareham. A very attractive species for the cold house. It produces two or three linear, angled leaves nearly two feet long and a slender stem bearing three flowers. The perianth is campanulate, the segments undulate with reflexing tips, pale blue shaded with darker colour externally and lightly striped within. Illustrated in the *Bot. Mag.* t. 562.

Laelia × ‘**Firefly.**’ A.M. February 19, 1935. From N. Prinsep, Esq., Pevensy. ‘*Coronet*’ × *harpophylla*. Although the flowers have narrow segments, they are attractive on account of the bright orange colour.

Primula malacoides ‘Presdales Double.’ A.M. January 30, 1935. From Mrs. A. R. McMullen (gr. Mr. J. Underwood), Presdales, Ware. Plant vigorous, compact, erect habit, foliage medium green; flower stems closely arranged and freely produced; flowers semi-double, 1 inch diameter, soft rose; petals somewhat curled, margins crenate; eye small, pale greenish-yellow. A good even stock.

Prunus Amygdalus Pollardii. F.C.C. February 19, 1935. From Lord Aberconway, Bodnant. A very handsome and free-flowering variety of the Almond. The flowers are large and of good substance with broad, overlapping, bright pink petals. The opening buds are attractively shaded with deep rose.

Prunus Conradinae semi-plena. A.M. March 5, 1935. From Mr. R. C. Notcutt, Woodbridge. *P. Conradinae* is a small-flowered Chinese Cherry twenty feet or more in height, with rose-pink buds opening to paler flowers in short-stalked umbels of five or six. The superior semi-double variety appeared in Mr. Collingwood Ingram’s garden at Benenden.

Rhododendron × ‘**Tessa.**’ A.M. February 19, 1935. From J. B. Stevenson, Esq., Tower Court, Ascot. *R. moupinense* × *R. praecox*. Raised by the exhibitor. A loosely branched, hardy shrub, the old bark splitting into shreds and exposing the light-brown young bark. Leaves stalked, elliptic, about 5 cm. long and 2.5 cm. wide, slightly convex, lepidote on both sides, bright dark green, veins evident above, light green below. Flowers two or three, sometimes up to seven in a truss, borne on reddish and distinctly lepidote pedicels which are 1-1.5 cm. long; calyx small, lobes regular, triangular, lepidote; corolla very shortly funnel-shaped and wide-spreading, up to 7 cm. across, delicate mauve-pink with darker spots at the back within; stamens unequal, up to 2.5 cm. long, filaments white and hairy at the base; ovary bright green and densely lepidote, style 3.5 cm. long, glabrous, white flushed crimson at the tip, stigma dark crimson.

GARDEN NOTES.

The Germination of Primula Seed.—The seeds of many plants appear indifferent to darkness and light during germination, but some species, of which *Lythrum salicaria* is the classical example, are particularly sensitive to light during germination and their seeds do not germinate in the dark. For example, a sample stored in the light and tested in November germinated 83 per cent. at 18° C. in ten days, and only 5 per cent. in the dark.

It has been found that the seed of *Primula Littoniana* is also light-sensitive. From seeds collected in October, dried and cleaned and stored in darkness in envelopes in a drawer, samples tested in January in a Copenhagen germination tank at 18–20° C. germinated in three weeks—in the light 82 per cent., in darkness 20 per cent. For each test replications of 200 seeds were used. The test was also repeated in fluctuating temperatures six hours a day at 18° C. and eighteen hours a day at 16° C.—germination in light 90 per cent., germination in darkness 1 per cent.

After transferring the seed from darkness to light they germinated quickly, giving a similar germination, 90 per cent., to those previously tried in light. Further tests with seed one year old gave similar figures—germination in light 78 per cent., germination in darkness 1 per cent., in twenty days. When transferred to light in the next twenty days—germination 65 per cent.

P. Florindae.—Samples of this species showed only a slight sensitivity to light, and when tested in March germinated in twenty days, in light 82 per cent., in darkness 62 per cent. Tested later in July, in light, germination 75 per cent., in darkness 65 per cent. Other species of *Primula* have been tested and do not appear to be sensitive to light in their germination. These include *P. microdonta*, vars. *alpicola* and *violacea*, *P. Winteri*, *P. magellanica*.

In sowing the seed of light-sensitive *Primulas* such as *P. Littoniana* it will be obvious that only a very light covering of soil should be employed, and that it is advisable not to cover the pots with a light-proof slate or other covering, but to use glass.—*M. A. H. Tincker.*

Acineta superba.—Discovered originally by HUMBOLDT, that celebrated traveller unfortunately placed this plant in the genus *Anguloa* as *A. superba*. Later the name *Peristeria Humboldtii* was given it, but eventually it was assigned to its present genus, Humboldt's specific name being retained. In Orchid collections, however, it is still frequently labelled *Acineta Humboldtii*.

As will be seen from the illustration (fig. 50), the flowers have a general resemblance to those of *Peristeria elata*, but examination reveals several

differences. Colour varies considerably, but is near fawn yellow, thickly spotted with red ; in some varieties the " red " nearly obscures the yellow. Usually seven flowers are borne on a stout descending scape. Of somewhat globose shape the blooms are remarkable for their thick wax-like substance. They do not expand fully, the sepals partially enclosing the smaller petals ; the labellum is particularly substantial, and its epichil, which apparently should have been broadly spreading, is so compressed as to have a decided keel. The flowers are pleasantly but not strongly aromatic.

Acineta is not a large genus, but occasionally other species are met with. All have a family likeness in habit, the stoutly ovoid pseudobulbs carrying two or three dark green, plicate, persistent leaves. In *A. Barkeri* the foliage may exceed 2 feet. In the present species it hardly reaches 18 inches.

On account of the pendulous nature of the spikes, orchid baskets must be used. Compost should consist of three parts of pulled Osmunda to one part of Sphagnum. In winter a minimum of 60° F. should be aimed at and the plants given a decided rest. In summer the temperatures should rise to the tropical with a moist, buoyant atmosphere, but at no time should water be allowed to lodge on the leaves or in the young growths. Briefly, cultivation is as for Stanhopeas.—*E. Cooper.*

Dendrobium Gibsonii.—Allied to the better known *D. fimbriatum*, this species is unfortunately not as common—unfortunately because, while the inflorescence is distinct in general appearance from that of *D. fimbriatum*, the individual flowers are larger and even more brilliant in colour. Vivid orange is perhaps the best colour term.

Each flower is 2 inches across the petals, broader and larger than the ovate-lanceolate sepals, the lip is shortly trumpet-shaped, the expanded blade densely tomentose with a daintily fringed margin, the centre is occupied by a deep crimson-red blotch, almost black. About seven flowers are carried in a raceme, the pedicel of each flower being hidden by a large bract.

The habit is similar to that of *D. fimbriatum*, but the stems seldom attain more than 30 inches in height and are more slender and paler in colour than in that species. The plant usually flowers in May, racemes being produced from any sound pseudobulb.

As in many other Dendrobiums it seems impossible to forecast the number of inflorescences, their paucity in some seasons being more than compensated in others by the numerous racemes which emerge from bulbs apparently long past the flower-bearing period.

A native of the Khasia Hills, the plant was named by PAXTON after Mr. GIBSON, who collected this and other orchids for the Duke of DEVONSHIRE in 1836.

Cultivation should be similar to that given the majority of Burmese and Indian Dendrobiums. Abundance of heat and moisture in the summer, exposure to light and more air in the autumn to ensure

ripening, and a decided rest in the winter, with then a minimum temperature of not less than 50° F.

Although plants often attain considerable dimensions the pot or pan used should be as small as possible, as water may then be given far more frequently than when too much compost is used.—*E. Cooper.*

Rose 'Golden Dawn.'—In his review of Mr. CHAS. RIGG's book, "Roses of Quality," in the R.H.S. JOURNAL, 58, p. 436, the reviewer questions the classification of 'Golden Dawn' by the National Rose Society as a Tea, and we cannot help feeling that this classification is quite a mistake. As distributors of this variety for Mr. PATRICK GRANT, the raiser, we probably have had a better opportunity of learning its history than most. If there is any quarrel with the term "H.T." in regard to it, we think it can be best overcome by including it under Hybrid Lutea. The seed plant is 'Elegante,' which seeds readily here, but 'Ethel Somerset' has never shown a seed pod as far as our experience goes. 'Elegante' undoubtedly has traces of Lutea parentage, and one would naturally expect in a seedling of this variety to find similar indications of Lutea ancestry. In our opinion this is amply demonstrated in the thorns, foliage and the characteristic short bud of 'Golden Dawn.'

Quite a number of other roses listed as H.T.'s might readily be given this same classification, and the following are just a few which can be classed as Hybrid Lutea varieties :

' Dame Edith Helen.'	' Max Krause.'
' Edith Nellie Perkins.'	' Mev. G. A. Van Rossem.'
' Elegante.'	' Mrs. W. C. Egan.'
' Elizabeth of York.'	' Oliver Mee.'
' Feu Joseph Longmans.'	' Rev. F. Page Roberts.'
' Gaiety.'	' Shot Silk.'
' Hilda.'	' Souv. de H. A. Verschuren.'
' Li Bures.'	' Talisman.'
' Mdme. Pierre S. du Pont.'	

H. Hazlewood, Epping, N.S. Wales.

LIBRARY NOTE.

THE recent purchase of Dodart's "*Mémoires pour servir à l'histoire des plantes*" adds a work of capital importance to the Lindley Library, and as such merits a few notes as to its origin.

It consists of 358 engravings from the famous paintings of Nicolas Robert, with a few pages of text, and is bound in two large folios, on which the Royal Arms of Russia tell their own tale. Nicolas Robert was born at Langres in 1614, and by his painting of the flowers in the famous "*Guirlande de Julie*" attracted the attention of Gaston d'Orleans, son of Marie de Medici and Henry IV. Perhaps the best that may be said of Gaston d'Orleans is that he was a keen gardener, and he solaced his exile at Blois by gathering around him a group of painters whose task it was to portray the plants in his garden. Among these was Nicolas Robert.

At the death of Gaston d'Orleans in 1640 these drawings numbered several hundreds and they passed to Louis XIV, and thanks to the far-seeing Colbert the collection was maintained and Robert was appointed Court Painter, with the task of adding each year a certain number of paintings. It was from these paintings that the engravings in Dodart's book were made.

At the death of Robert in 1685 the collection was maintained, and such famous artists as Jean Joubert, Aubriet, Madeline Basseporte and Gerard Van Spaendonck carried on this remarkable collection. After the Revolution the names of Redouté and Bessa appear as artists with de Fontaine, Le Sourd and d'Adele Riche. This remarkable series of drawings is to-day at the Jardin des Plantes and is now known as "*Les Velins du Museum.*"

The special interest of the early drawings by Robert and his contemporaries lies in the number of American plants which are there figured. Unfortunately, owing to its early date, the plants do not come within the scope of Pritzel's references, but the whole collection forms a mine of historical information which, so far as I know, has not yet been explored, and which no student of the history of garden plants can afford to neglect.

Small collections of these engravings often appear in booksellers' catalogues. The complete series as in Dodart's volume is exceedingly scarce.

According to Pritzel's *Thesaurus*, a first edition was published in 1676, with 38 figures and text, and 64 without description. The second edition, which is the one we have secured, was published in 1679 and has 358 plates.

A third edition was published at Amsterdam in 1758, and this edition is also in the Lindley Library.

Edward A. Bunyard.

BOOK REVIEWS.

"Gardening in East Africa." Edited by Dr. A. Jex-Blake. 8vo. xv + 330 pp. 6 coloured plates. (Longmans, Green, London, 1934.) 12s. 6d. net.

Anyone who has seen the lowlands and highlands of Kenya and met the enthusiastic members of the Kenya Horticultural Society must be aware of the immense possibilities of gardening in that country and the need for a reference work on gardening specially written for East Africa. Almost every kind of climate is met with from the humid tropics to the alpine snows. The volume now produced is probably unique. It contains twenty chapters written by almost as many authors, all of whom are experts, or at any rate keenly interested in their subjects. For a general work, covering a wide field, composite authorship is a sound method, and the editor and authors alike are to be congratulated in having furnished a really valuable handbook. Compressed within its pages is an outline of the elements of gardening, a round dozen chapters on various classes of plants with lists of species recommended and several chapters on scientific subjects.

The country and climate of Kenya being so varied the chapter (following the foreword by Sir Arthur Hill) on climate by the Director of the East African Meteorological Service is appropriate, as also are the clearly written chapters on soils and manures by the Government Agricultural Chemist. After an outline of elementary horticulture and propagation we come to the main portion of the book (pp. 49-238). This consists of chapters dealing with plants grouped according to the following categories: Annuals, Perennials, Roses, Flowering Trees and Shrubs, Climbing plants, Bulbous plants, Indigenous plants, Hedges and Ornamental foliage trees, Vegetables, Deciduous Fruits and Tropical Fruits. These are contributed by well known members of the Kenya Horticultural Society. A humorous article devoted to "Gardening at the Coast," by H. B. Sharpe, the District Commissioner, will be perused with profit, not only by readers at Mombasa but by those living at sea-level in many other tropical countries. A chapter on gardening in Uganda, prepared by the Government Botanist for that Colony, is included. Though fungus diseases are not serious in East African gardens, a chapter on these is provided by the Kenya Government Mycologist and also one on Insect Pests by the Government Entomologist. Mention of an attractive little map inside the covers should not be omitted.

In the classified section each chapter is prefaced by a general account on practical lines and is followed by an annotated list of the species which can be grown successfully. Almost all annuals do well. Though many perennials thrive amazingly, some are tricky or refuse to flower except in the highlands (e.g. *Anchusa*). The chapter on Roses is useful and instructive. The accounts of flowering shrubs and climbing plants by Lady Muriel Jex-Blake are perhaps the most interesting. These plants are described as the backbone of Kenya gardens, since they do not disappear during an extra dry season or during a visit of the owner of the garden to Europe. The lists are lengthy and a credit to the pioneer Kenya gardeners. Intermixed with the well-known temperate genera are many others familiar in this country as stove or greenhouse plants such as *Allamanda*, *Bougainvillea*, *Brunfelsia*, "Poinsettia," *Stephanotis* and *Tibouchina*, all of which, of course, thrive outdoors. Some genera, such as *Rhododendron*, cannot be recommended; and although the native *Erica arborea* flourishes, the Cape species have so far refused to become established. Lilacs, as seen in the arboretum at Nairobi, not only will not flower, but refuse even to grow, presumably because they require a prolonged chilling, as Coville has proved by experiments in Washington to be necessary for certain shrubs. The Chilean group represented by *Desfontainaea*, *Eucryphia*, etc., are a failure at Nairobi, but are worth a thorough trial at higher altitudes.

The section on bulbous plants contains an astonishing mixture. Its author explains that all plants with fleshy roots are included, but this conception seems capable of infinite expansion, since the list comprises, amongst other unexpected names, those of *Dracaena*, *Yucca*, *Cortaderia*, Bamboos and even *Aquilegia*! The list is not rendered easier of consultation by the fact that the names are arranged neither in a single alphabetical sequence nor in systematic order, but according to alphabetically-arranged families—a compromise of systems which hardly secures the advantages of both and demands, moreover, some botanical

knowledge. It would have been preferable to have referred many of these plants to their more obvious categories of herbaceous plants, trees and shrubs. It is interesting to note, however, that the author recommends many South African bulbs, and it is to be hoped that other genera of these beautiful plants may be introduced later. The lists of indigenous plants (trees, shrubs, bulbs and herbaceous plants) and of exotic ornamental trees are of especial interest, contributed as they are by Mr. H. M. Gardner, the Conservator of Forests, who has done so much to build up the splendid arboretum under his charge at Nairobi. In the first list the handsome native Conifer, *Podocarpus gracilior*, finds a place and in the latter introduced Conifers, and of these *Araucaria Cookii*, which grows so magnificently in the arboretum and is the admiration of every visitor, may be specially mentioned. This section of the book concludes with two very valuable chapters on fruits and a particularly well written article on vegetables.

Though written from the Kenya standpoint and primarily for residents in that Colony, the work has a much wider application. Gardening in Kenya and Tropical Africa as a whole is in its infancy. It is clear that there is a wealth of other plants which could be introduced. In addition to being an introduction to the subject, the volume edited by Dr. Jex-Blake provides a remarkable record of achievements in the importation and establishment of exotic plants. As such it will be read with interest by the pioneers who are still experimenting and will be invaluable to newcomers who are trying to adapt themselves to unfamiliar conditions. The chief regret felt is that it was not possible to include more details in the annotated lists. The ground has, however, been covered and specialists in years to come have now to elaborate the various sections as required, and as material becomes available.

A. D. COTTON.

"A Plant Hunter in Tibet." By Capt. F. Kingdon Ward. 8vo. 317 pp. (Cape, London, 1934.) 12s. 6d.

Capt. Kingdon Ward has a fine story to tell of his geographical and botanical explorations in 1933, and he tells it well.

This expedition was a continuation of twenty-five years' exploration by Capt. Kingdon Ward in this corner of Asia. The author's object was both to discover beautiful flowers and shrubs likely to grow out of doors in these islands and to bring back seed of them, and to find out if a great range of snow mountains exists between the Tsangpo and the Salween, two of the districts that he had explored in former years. He was successful in both these objects and has illustrated his book with beautiful photographs of the mountains and the flowers. One can follow his journey by the clear maps provided; these are necessary as the Tibetan names are difficult to follow. His objective was the high plateau north and south of Shugden Gumpa which had been visited by explorers once or twice before, but had never been searched for plants. It is fascinating to follow the travellers on their journey through the different floras; one meets friends that are known so well to those who grow Himalayan and Chinese plants: first, at the lower levels, *Ceratostigma Griffithii*, *Rosa bracteata* and the Carmine Cherry; then, as they go higher, *Rhododendron megacalyx* and *R. bullatum*; still further up come the Pine forests with *Magnolia Campbellii* and *Rhododendron sino-grande*; then above tree-line the *Rhododendron* scrub with Birch, *Syringa* and *Potentilla*, and finally they reach the alpine region with *Meconopsis*, *Primula*, *Iris* and *Gentian*. It makes a gardener's mouth water to read of the glorious flowers, to see the photograph of *Magnolia Campbellii* in full flower and of the sweet-scented *Stellera Chamaejasme* now lost to cultivation, and to read of *Viburnum Wardsii*, which no one has yet been able to raise, "wreathed in white blossom with its crinkly deep green leaves already fully developed and shining in the sun." In order to see these wonderful things the explorer has to go through many hardships and discomforts that few men can stand. Capt. Kingdon Ward makes light of the wet and cold, the bugs and dirt and the general continuous discomfort. The traveller in these unknown parts of the world has to be a mountain climber of no mean order and also a very tactful diplomatist to get on with the Tibetan headmen and the abbots of the monasteries, and to persuade the native porters to travel over glaciers and snow-covered passes at 15,000 and 16,000 feet.

Round Shugden Gumpa exploring for plants and the collection of seed was concentrated upon and many lovely Gentians were discovered: *Gentiana trichotoma*, so rare in cultivation, was found here, and *G. Georgei*, which is new to gardens: "the Gentians swept in irresistible and incredible blue seas over the windy crest of Ningri Tangor," writes the author. It is interesting that two *Rhododendrons*—*R. vellerum* and *R. tsarongense*—are recorded here as growing on limestone.

It is as thrilling as any novel to read of the night when the servants got mad drunk, and how the author extricated himself from an unpleasant and dangerous

position. His last chapters describing the journey through the Mishmi Hills by a new and shorter route are fine reading: it was the third time he had marched safely out of this dangerous district.

Gardeners who grow these beautiful plants—*Meconopsis*, *Primulas*, *Gentians* and *Rhododendrons*—and raise them from seed so easily, will appreciate them all the more after reading this book and realizing what discomforts and difficulties the explorer has to overcome to find the plants and to bring the seed safely home. The book has excellent print and the index is admirable.

F. C. STERN.

"Some Beneficial Insects." Bull. 20. Ministry of Agriculture. Ed. 3. 8vo. v + 14 pp. (H.M. Stationery Office, London, 1933.) 6d. net.

Ladybirds, Ichneumons, Chalcid and Braconid flies, Hover flies, Lacewing flies, certain beetles and bugs do an enormous amount of good for horticulturists by destroying pests. This handy Bulletin describes them and their ways. The use of such insects propagated purposely is also discussed and the limited value of such procedure clearly set out.

"Les Fleurs de Jardins." By A. Guillaumin. 8vo. cxxvii + 80 pp. (Lechevalier, Paris, 1934.) 36 fr.

This is the third part of M. Guillaumin's *Fleurs de Jardins* and deals with the flowers of summer. The early part of the book suggests plans for borders and beds with plants suitable for different positions, the latter with the plants themselves giving for each a coloured plate (64 in all), the common names, botanical characters, natural habitat and distribution, form and use in the garden, cultivation, economic uses, and a list of nearly related plants where such seems of value. Herbaceous plants alone are dealt with.

"The Manuring of Vegetable Crops." By A. H. Hoare. 8vo. v + 63 pp. (H.M. Stationery Office, London, 1934.) Paper covers, 1s.

This is an excellent review of the matter with which it deals, giving brief but pithy notes on the various substances available for use as manures and suggestions for the manuring of all kinds of vegetable crops. It is written, naturally, with the market-garden industry in view, and with the crops on soils traditionally suited for them. The suggestions may thus be less suited to the private gardener who endeavours to grow crops of all kinds on the soil of the district he inhabits, and with conscientious cultivation usually succeeds in the same garden with crops as diverse in their requirements as peas and carrots, cabbages and beet.

"Man Hunts and Plant Hunts, being the Adventures of George Forrest." 8vo. 89 pp. (Scottish Rock Garden Club, Edinburgh, 1935.) 4s. 6d.

The title of this account of some of George Forrest's work is not the most illuminating thing about it. One rather wonders why "man hunts" forms part of it, and your reviewer is wondering still. Never mind! It is an interesting book about one who was not very easy to know, but who found his part in the world's work and who played it well, till death took him in the midst of what he had designed to be his last journey in search of plants. No one has enriched our botanical collections with such a vast number of excellent specimens, copiously annotated, from an hitherto unknown floristic region as he did. Few have introduced so many plants from the wild destined to have a continuing place in our gardens. Few who have sent home seed from such districts have sent it home so successfully. Very few who have had such an adventurous life and have so successfully accomplished the task they set out to perform, have left such meagre written record of it all—apart from the notes already alluded to. The pages of our JOURNAL give some of the record, the appreciation which we printed after his lamented death tells something of the man, and now comes this further record, compiled and arranged by Messrs. R. E. Cooper, A. O. Curle and W. S. Fair. We welcome it as a step towards an adequate life of a great plant collector who added particularly to our knowledge of *Rhododendrons* and *Primulas*, and sent home seeds of plants of many another genus of horticultural value—value which will be proved as time goes on.

A number of well-reproduced illustrations of plants and portraits and scenery add to the value of the book.

There is no title page, and we have quoted the wording on the dust cover as the title.

"Everyday Botany." By L. J. F. Brimble. 8vo. viii + 589 pp. (Macmillan, London, 1934.) 7s. 6d.

This is an excellent elementary account of the structure and life of plants, something more than a textbook of botany as generally understood. It shows to a considerable extent the place members of the vegetable kingdom play in the economy of nature, and in the activities of civilized man, and these side-lights bring into prominence many a fact or incident which otherwise might be lost in the shadow of other facts and incidents of perhaps equal scientific but less human interest. The author has not been content to tell of what others have discovered or surmised; he tells also something about many of the men who have probed into the secrets plants have held, and thus again connects the study with its human side. Here and there he has perhaps allowed himself, in his desire to write simply, a certain measure of looseness of reasoning, a little lack of precision of expression, but not so great as to mar the performance of the task he set himself. The book is well illustrated by 340 figures, many of them by the author.

"Practical Plant Anatomy." By C. J. A. Berkeley. 8vo. 112 pp. (University of London Press, 1934.) 3s.

This is a useful companion for the beginner in the microscopic examination of plant tissues who is not content—as no true learner will be—with the examination of sections prepared by others. The difficulties met with in preparing material as well as the source of material suitable for the illustration of most of the structures and cell contents likely to be met with in ordinary plants are clearly indicated and it is a book we can heartily commend to the beginner.

"Wild Flowers in Literature." By Vernon Rendall. 8vo. 372 pp. (The Scolartis Press, London, 1934.) 12s. 6d. net.

Mr. Vernon Rendall has collected the references to English wild flowers which he met in the course of his reading, and arranged them under the Natural Orders with a robust commentary in which the note of self-confidence is almost always justified by a first-hand acquaintance with the subject. The book "deals with the familiar," and so do the authors quoted, most of whom have gathered their flowers by the roadside, but it is illuminating to see our old friends through the vision of the artist—to observe Ivy with the close and interested attention of the poets, or to see *Arum maculatum* looking "like an apoplectic saint in a niche of malachite," as it appeared to the sardonic eye of Thomas Hardy.

Mr. Rendall is sometimes a little hard on his authors: Ben Jonson's "blue bindweed" may well have been the Woody Nightshade and not "clearly a made-up vision"; and Henry Kingsley, who is criticized for including "ladies' slippers" among meadow plants, was presumably referring to *Lotus corniculatus* and not, as the commentator infers, to *Cypripedium Calceolus*, which (with something less than his usual accuracy) he calls here an orchis.

The book would have been not much less interesting if the discursions on folk-lore and herbalism, which seem a little out of place, had been omitted, while, on the other hand, some readers may regret the author's decision that trees lay outside the scope of his title.

F. HAMPTON.

"The Squabbling Garden." By Marion Cran. 8vo. 294 pp. (Jenkins, London, 1934.) 10s. 6d.

Marion Cran is very clever with her titles. Although there are animadversions in this book upon family relations there is no serious squabbling, nor do we find records of the contests that sometimes rage in silence among the plants on the rock garden. On the contrary, save for remarks on a certain stringency at times in money affairs, all, or nearly all, in the garden and in the house is lovely.

"Squabbling" is here derived from "squabs," the young of pigeons, and the garden is the site of pigeon houses devoted to the raising of squabs for profit. This is the story of the inception of the idea of "raising the wind" by means of pigeons which have not yet learned to fly, and of the way in which the idea took concrete form and apparently realized the hopes which brought the idea to reality. The way difficulties and setbacks were met, the triumphs and the disappointments, the joy of the pleasant sound of cooing doves and now and then incursions into the realms of plants are told in the inimitable way her many readers have learned to look for in Mrs. Cran's books. In short, it is "another Marion Cran book."

"The Cultivation of Mushrooms." By W. F. Bewley, D.Sc., and J. Harnett. (Shepherd and Hosking, London.) 2s. 6d. net.

The art of growing Mushrooms is one that in recent years has attracted an increasing number of people. To the amateur it is an interesting and, we might almost say, a fascinating hobby; to the grower a business needing very careful supervision if a successful crop is to be secured. The work is not difficult, but mistakes are more likely to lead to failure than with most other crops. Information is thus always welcome, and most growers are ready to consider new methods, although generally reluctant to reveal their own technique.

Here we have a little book which describes modern methods and processes used for the production of Mushrooms. There can be little doubt that it will be eagerly read and considered. The authors represent a powerful combination—a well-known and practical scientist co-operating with a successful grower to provide us with knowledge gained by years of experience.

The book is one of 63 pages, but within this small compass it furnishes detailed instructions for the successful cultivation of the Mushroom. We are told in simple language what the Mushroom is, how it grows, and old and new methods employed in the making of spawn, which is the starting point in the growth of the cultivated forms. The selection or building of suitable sheds, adaptation of greenhouses and frames, and making of beds in the open air, are all well described and illustrated. That most important part of the work, viz. the preparation of the compost from fresh horse manure, is explained in detail. Then follows making the beds, planting the spawn, and the process of covering the beds with soil known as casing. Subsequent care of the beds until the Mushrooms appear is dealt with, and directions for picking, packing and grading are given.

The final chapter gives precautions to be taken to avoid diseases and pests, and methods of dealing with any that appear. If this chapter had been given in greater detail it would, in our opinion, have added considerably to the value of the book.

The print is very clear, and there are no fewer than 13 illustrations, about half of which are very fine photographs of important operations in Mushroom-growing. The low price represents remarkable value for the amount of information in such readable form.

D. E. GREEN.

"The Brown Rot Diseases of Fruit Trees." By Dr. H. Wormald. Bulletin 88, Ministry of Agriculture. 8vo. v + 50 pp. (H.M. Stationery Office, London, 1935.) 1s. 6d. paper covers.

This is an excellent and authoritative account of the group of fungi which bring about the brown rot of apples, pears, plums, cherries, and related fruits, and which produce the mummy fruits so abundant in neglected orchards. These are a fruitful source of infection of blossoms (blossom wilt) in spring, of wither tip and some forms of canker, and of fresh outbreaks of brown rot in such fruits as may happen to be produced.

Not only are the diseases and their symptoms clearly described and methods of control indicated, but a clear account of the fungi causing them is given and their characteristics defined. The Bulletin should thus prove of value not only to growers but also to students of plant pathology as the most recent account of a series of diseases which do no little damage in countries with a somewhat moist climate where the growing of apples, pears and stone fruits is of importance.

"The Diseases and Curing of Cacao." By H. R. Britton Jones. 8vo. x + 161 pp. (Macmillan, London, 1934.) 10s.

This handbook has been prepared for the use of planters and agricultural officers, and to some extent technical descriptions of the fungi causing disease and the like have been omitted. Though this is so, the synonymic history of the causal fungi is given.

As with many diseases of plants in our country, so with Cacao. Good cultivation of the soil, adequate drainage, sufficient exposure to air, reasonable pruning, and the like often prove more effective in keeping plants in health than spraying and similar methods. This account emphasizes this in many ways. Even "witch's broom" is to some extent controlled by attention in these directions.

Chapter V is devoted to the preparation or curing of Cacao (pp. 115-143), concerning which a great amount of literature exists. The literature is here summarized and compared.

A bibliography of nearly two hundred titles adds to the usefulness of the book.

NOTES AND ABSTRACTS.

Apple Blossom Weevil (*Anthonomus pomorum* Curt.), **An Experiment on the Control of the, by Means of a Derris Dust.** By G. L. Hey, A. M. Massee and W. Steer (*Ann. Rept. East Malling Res. Stat.*, 1933, pp. 217-219).—The application of a proprietary Derris dust of a somewhat heavy type (0.14-0.15 per cent. crude rotenone, 0.13 per cent. re-crystallized rotenone) halved the injury caused by the Apple Blossom Weevil when applied at the green-bud stage. No appreciable effect was obtained if the dust was applied a week earlier—the possible reasons for which are suggested.—G. F. W.

Asparagus Miner (*Melanagromyza simplex* Loew.), **The.** By H. F. Barnes and C. L. Walton (*Entomologist's Monthly Magazine*, 1934, vol. lxx, pp. 183-185).—The occurrence of puparia of this Agromyzid fly was noted in the stems of Asparagus during 1933.

From one to ten puparia on a stem were found throughout the Evesham Asparagus area, and occurred in 30 per cent. of the stems.

The larvæ mine beneath the cuticle, but there is little indication that the infestation is of serious import at the moment.

Comparison is made between the life history of this fly and that of the Asparagus Fly or Borer (*Platyparea poeciloptera* Schrank), a Tryptetid whose larvæ bore in the stems, and which is a serious pest on the Continent and in the United States.

The most satisfactory control measure against the Miner is to pull and burn the infested stalks in late autumn and early spring.—G. F. W.

Bulb-Scale Mite (*Tarsonemus approximatus* Banks var. *narcissii* Ewing), **The Bionomics of the.** By W. E. H. Hodson (*Bull. Entom. Research*, 1934, vol. xxv, pt. 2, pp. 177-185; 2 plates).—The occurrence of Tarsonemid mites in abundance on a sample of Narcissus bulbs in 1932 made an investigation desirable as to the importance of the mite as a pest. This mite has since been found on several varieties, and it is definitely of widespread occurrence.

Descriptions are given of the several stages—adult, larval and egg.

The signs of attack in the dormant bulb, in the forced bulb, and on bulbs in the field are described in detail.

The biology has been studied in some detail, and it was found that the injury to forced bulbs is considerable, owing to the early applications of heat, which permits of rapid increase of the mites at an early stage in the growth of the plant.

The control measures advocated against this pest include: (i) the biennial lifting of bulbs and their subjection to hot-water treatment as recommended for controlling bulb eelworm and the larvæ of the Narcissus fly; and (ii) the spraying of forced bulbs as soon as the leaf tips part, with a white oil emulsion to prevent severe flower damage.

A warning is given as to the similarity between the symptoms of attack by the Bulb-Scale mite and mosaic infection known as 'Yellow Stripe.' The not infrequent cases of reputed recovery from mosaic after hot-water treatment are due entirely to a faulty diagnosis having been made in the first instance.

G. F. W.

Byturus tomentosus Fabr., **Studies on. IV. 1933 Experiments on the Control of the Raspberry and Loganberry Beetle.** By W. Steer (*Ann. Rept. East Malling Res. Stat.*, 1933, pp. 188-196).—Confirmation of previous results was made that a spray containing sufficient finely ground Derris to give a rotenone content of 0.005 per cent., and 5 lb. of soft soap to 100 gallons of water, proved highly toxic to the larvæ of *Byturus tomentosus*.

The 1933 trials indicated that satisfactory results can be obtained both on Raspberries and on Loganberries with one application given when the larvæ commence to attack the berries—i.e. normally towards the end of June.

The effectiveness of control measures can be improved in the case of Loganberries as regards the later pickings of fruit by giving an additional spraying shortly before picking begins.

The pest can be controlled on cultivated Blackberries by means of a single spraying of Derris and soap applied about a fortnight after the Loganberries are sprayed.—G. F. W.

Cacoecia crataegana Hub. (Lepidoptera; Tortricidae) on Fruit Trees in the Wisbech Area, On the Biology of. By G. L. Hey and I. Thomas. (*Ann. App. Biol.*, 1933, vol. xx, pp. 439-462; 13 figs., 2 plates).—The occurrence of this Tortricid moth on fruit-trees is rare in this country—its normal food plants being Oak, Elm and Sallow.

Descriptions are given of the several stages—egg, larval, pupal and adult.

In the Wisbech area the egg masses were found only in three localities and occurred on Apple, Plum, Pear and Cherry.

The larvæ feed only on well-developed leaves, so that its economic importance is small unless present in large numbers.

While no attempt was made to devise means of control, observations showed that the effect of ordinary routine spraying with tar oil washes on the egg masses was slight, and that lead arsenate appeared to have little effect upon the larvæ, owing to their habit of feeding inside the rolled leaves, where the spray could not penetrate.

The parasitism of the moth has been studied and one Dipterous and five Hymenopterous parasites have been bred out. The biology of the egg parasite *Trichogramma evanescens* Westw. has been studied in detail.—G. F. W.

Dwarfing Disease of Cultivated Violets associated with the Eelworm, *Aphelenchoides oleistus*. By L. N. Staniland and T. Goodey (*Jour. Helminthology*, 1934, vol. xii, pp. 13-22; 9 figs.).—While a similar disease in Violets was recorded in 1911 by Schwartz in Germany, the points of difference between the disease described by the German author and that which occurred in Devon during 1932 are: (i) that the German plants exhibited marked gall-formation, whereas no galls were found on the Violets from England; and (ii) that the eelworms were internal parasites in the galls found by Schwartz and external in the case of the English-grown plants, occurring on the crown of the plant amongst the bases of the leaf-stalks and developing leaves surrounding the growing point.

The incidence of the disease is given in detail.

The symptoms of attack are described—dwarf plants which have a generally stunted and flattened appearance when all the crowns are affected, and deformation of the leaves—the general appearance of the plant resembling the well-known 'red-plant disease' of the Strawberry.

The morphology of the parasite is given together with figures of the adult male and female eelworms.

The following suggestions are made for controlling the disease: (i) the propagation from healthy vigorous plants only, and the rejection of any runners showing symptoms of attack; (ii) the destruction of any plants which develop the symptoms during the season; (iii) the encouragement of regular growth of the plants; (iv) the avoidance of growing Violets on the same ground for two successive seasons; and (v) the subjection of runners to hot-water treatment at a temperature of 110° F. for a period of 30 minutes followed by plunging into cold water, and immediate planting of the treated stocks.—G. F. W.

Insect and Allied Pests of Cultivated Mushrooms, Investigations on the. I. *Sciara fenestralis* Zett. By M. D. Austin and S. G. Jary (*Jour. S.-E. Agric. College, Wye*, 1933, no. 32, pp. 59-62; 3 figs.).—Among the several species of Sciariid flies which have been recorded as attacking Mushrooms, no mention has previously been made of *Sciara fenestralis* as a pest of Mushrooms.

Detailed descriptions are given of the several stages—egg, larval, pupal and adult.

The typical damage caused by the larvæ takes the form of extensive tunnelling within the stalks and caps. The larvæ feed also on the mycelium, and in so doing prevent the formation of buttons.

Control measures include: the use of fly-papers, either laid on the beds or suspended near windows, to trap the adult flies; the volatilization of Nicotine in houses that admit of fumigation; and the frequent application of 1 oz. of Nicotine (95-98 per cent.) in 10 gallons of water to the beds when the flies are first seen—a fine-rose watering can is suitable for the purpose. The addition of soap solution has a harmful effect on the growth of the mushrooms.—G. F. W.

Kalanchoe Blossfeldiana (syn. *K. globulifera* v. *coccinea*). By K. von Poellnitz. (*Fedde's Rep. Sp. Nov.*, xxxv. pp. 159-160; 1934).—The dwarf, bright red and very free-flowering *Kalanchoe* known as *K. globulifera* v. *coccinea* has for some time been recognized as a species distinct from *K. globulifera*,

which has almost sessile (instead of distinctly petiolate) leaves, a glandular (no glabrous) stem and inflorescence, and a few yellow (instead of numerous red) flowers; both are natives of Madagascar. As there already exists a *K. coccinea*, the popular *K. globulifera coccinea* is here given the new name of *K. Blossfeldiana* in honour of the German nurseryman who has commercialized it.—W. T. S.

Lewisia and other North American Portulacaceae, Revision of. By P. A. Rydberg (*North Amer. Fl.*, 21, pt. 4, pp. 279–336; 1932).—This revision comprises keys and descriptions of all the genera and species of Portulacaceae native to North America, the most important for horticultural purposes being *Lewisia*, *Talinum* (31 species), *Claytonia* (19 species), *Portulaca* (23 species) and *Calandrinia* (12 species). The author has always been a "splitter" and in this work *Lewisia* is confined to *L. rediviva* and two close allies (*L. minor* Rydb., *L. disepala* Rydb.), *L. triphylla* is put in a genus (*Erocallis*) by itself and all the other plants currently referred to *Lewisia* make up the genus *Oreobroma*, 20 species (3 new) of this genus being distinguished. *Oreobroma* is separated as having "sepals 2; pedicels not jointed to the peduncle; bracts 1 or 2" from *Lewisia* with "sepals 6–8, imbricate; pedicels distinct; joined to the peduncle; bracts 3–7, verticillate"; one species of *Lewisia* (*L. disepala* Rydb.) however is described as possessing "Sepals 2 * * * bracts 2 or 3," thus blurring these distinctions and suggesting that it is wiser after all to keep *Lewisia* as one genus. Nevertheless this is a useful work on account of its comprehensive nature and detailed descriptions even for those who do accept the author's views as to what constitute generic and specific differences.—W. T. S.

Lygus pabullinus L., A Note on. By M. D. Austin (*Jour. S.-E. Agric. College, Wye*, 1933, no. 32, pp. 168–170; 2 figs.).—While it is well known that the Common Green Capsid Bug has a particularly wide range of host plants during the summer and that the winter is passed in the egg stage on plants of a woody nature, more especially Apple, Currant and Gooseberry, it is less generally realized that this Capsid oviposits in the tissues of plants other than those mentioned.

The author has found a plentiful supply of eggs in the new growths of the Blackberry, and considers that the overwintering on this plant is of more common occurrence than formerly.

It is assumed that the usual ovicidal washes cannot be applied to Blackberry bushes during the winter, so that spring and summer spraying of this crop will be necessary.—G. F. W.

Ovicidal Action of Winter Washes, Studies on the: 1932 Trials. By M. D. Austin, S. G. Jary and H. Martin (*Jour. S.-E. Agric. College, Wye*, 1933, no. 32, pp. 63–83; 1 fig.).—Investigations were commenced in 1931 to test the ovicidal action of tar, petroleum and vegetable oils, and a comprehensive series of laboratory and field trials was carried out and is here described in detail.

Laboratory tests of the ovicidal efficiency of various oils on the eggs of the Common Green Capsid, *Lygus pabullinus* L., gave the following results: (a) Petroleum and Vegetable Oils at 6 per cent. are more effective ovicides than Tar Oils; (b) Seventeen Petroleum Oils of different characteristics and bases gave a complete control of the capsid when applied at 5 per cent.; (c) the addition of high-boiling Tar Oils resulted in increased ovicidal efficiency of the Petroleum Oil washes; and (d) no difference was found in the ovicidal efficiency emulsions prepared by the two-solution oleic acid method and by the use of Bordeaux mixture.

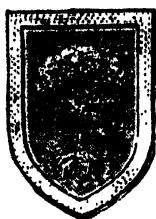
The results of field trials of various Tar-Petroleum oil mixtures emulsified in all trials by the oleic acid method and, in two trials, by means of 4:6:100 Bordeaux mixture, are explained in detail.—G. F. W.

Plum Sawfly (*Hoplocampa flava* L.), On the. By H. W. Miles, I. Thomas and G. L. Hey (*Ann. App. Biol.*, 1933, vol. xx, pp. 722–730; 6 figs., 2 plates).—*Hoplocampa flava* appears to be the species definitely associated with injury to the developing fruits of the Plum. Its distribution over England is general, and it is likely to be of economic importance when Plums and Damsons are grown extensively.

The adult is described and comparisons are made with other British species of *Hoplocampa*. Minute descriptions, together with figures, are given of the egg and the five larval instars.—G. F. W.

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Part 5

May 1935

THE GARDENS OF THEIR MAJESTIES THE KING AND QUEEN AT WINDSOR.

By Mr. C. H. COOK.

Extract from the "Annals of Windsor" :

" THE ROYAL GARDENS WINDSOR.

" 1841. The formation of the new gardens at Windsor was carried into effect by means of an Act of Parliament which recites that it was expedient that a new Kitchen Garden etc. should be attached to Windsor Castle adequate for the supply of the needs of Her Majesty's Royal Household, Her Heirs and Successors."

This gives us the date of the foundation of the Royal Gardens as we know them to-day.

Queen Victoria ascended the throne in 1837 and spent the greater part of her life at Windsor Castle and Frogmore, leaving it only for official duties, and for holidays in Scotland or the Isle of Wight.

Between 1901 and 1905 many alterations were carried out in the gardens by the late King Edward VII and Sir Dighton Probyn. The houses were remodelled, new heating was installed, and offices and buildings connected with the gardens were brought up to date and extended. The whole layout of the houses and gardens is on a large scale and adapted for the supply of flowers, fruit, and vegetables for a large household rather than as a show place. Sandringham, on the other hand, may be considered one of the show places of England.*

* Their Majesties' garden at Sandringham is described and illustrated in JOURNAL R.H.S., 57, p. 163.

The Court being at Windsor Castle for only two short periods during the year all the produce of the gardens for use in the household has to be sent to wherever the Court may be in residence.

The glass-houses consist of two fruit ranges, each of over 300 yards in length. One range, built ninety years ago, is constructed of iron and copper with a sliding glass roof. This range is in a splendid state of preservation to-day. The other fruit range was built of teak and is a three-quarter span. These two ranges contain all the best varieties of Grapes, Peaches, Nectarines, Figs, Strawberries, etc. The first fruit to ripen is the Strawberry, closely followed by 'Black Hamburgh' and 'Foster's Seedling' Grapes, early Nectarines 'Lord Napier' and 'Humboldt,' Peaches 'Hale's Early' and 'Early Rivers' and Fig 'Brown Turkey.'

Besides these two ranges there are two large palm houses, each 50 yards in length, which are now used as pot-fruit houses. One house is filled with a collection of dessert Cherries which give excellent crops every year. The varieties grown are 'Governor Wood,' 'Black Eagle,' 'Early Rivers,' 'Elton Heart,' 'Géant d'Hedelfingen,' 'Bigarreau Schrecken,' etc. The second house is filled with dessert Plums, including such varieties as 'Coe's Golden Drop,' 'Denniston's Superb,' 'Jefferson,' 'Kirke's,' 'Golden Transparent' and 'Green Gage.' Both the Cherries and Plums remain in the houses throughout the year. There is no fire heat used at any time, but abundance of air is given at flowering and ripening times, with slightly closer conditions during the stoning and growing periods. The first Cherries to ripen are 'Black Tartarian' and 'Early Rivers.' The selection of varieties keeps up the supply until mid-August, some even hanging on after the outdoor crop is gathered.

Between these two ranges are twenty-six full-span plant houses, running north and south, for the supply of plants and flowers for house decoration. The chief occupants are *Hippeastrums*, Carnations, *Zantedeschia macrocarpa*, *Z. Elliotiana* and *Z. aethiopica*, *Calanthes*, *Cymbidiums*, *Gardenias*, *Clivias* and *Azalea indica*. As these go out of flower their places are taken by large quantities of bulbs, *Schizanthus*, Zonal and Regal *Pelargoniums*, *Begonias*, *Hydrangeas*, Sweet Peas, *Chrysanthemums*, etc. In keeping up the supply of flowers it will be noted that a point is made of growing flowers that are suitable for packing and give a good display in house decoration. Their Majesties take a keen delight in all flowers, soft shades being most in favour. Her Majesty appears to favour the Carnation, closely followed by Roses, Daffodils, and Violets, and His Majesty chooses first the *Gardenia* as a buttonhole flower, while his favourites for room decoration are *Cymbidiums*, Roses and *Calanthes*. His Majesty delights in the display of masses of Daffodils and flowering shrubs in the grounds, and takes the keenest interest in fruit and vegetable crops. Their Majesties take a great pleasure in conducting their guests through the gardens and houses.

Before passing on to the outdoor department it may be of interest

to quote some of the contractors' supplies of material for the building of the new ranges of glass from 1901 to 1905: 1,900,000 bricks, 1,800 tons of lime, 1,000 tons of Portland cement, 160 tons of Rangoon teak wood, 18 tons of putty, 10 tons of paint, 10,000 sup. feet of 1-inch slate slabs for staging, 156,500 sup. feet of glass, 11 miles of 4-inch hot-water piping, 6 Cornish boilers (22 feet long), 2 storage tanks (each of 80,000 gallons capacity). The Bothy was built during this time and can house 22 single men, with rooms for the caretaker. Each man has a separate room, and there are bathrooms, and recreation and dining-rooms, with central heating throughout.

The plant houses are connected by a corridor which runs their whole length. Half of the corridor is planted with fruit trees. One section contains Apricots: these are planted in a narrow border and have given excellent crops since 1928. Another division is filled with Figs, and a third with cordon Apples and Apricots. The whole of the plant corridor is planted with a collection of Fuchsias, trained along the roof, which, when in flower, give a brilliant display. This corridor also has several divisions, each filled with decorative plants and flowers. Six houses are devoted to Calanthes, and amongst the varieties grown are *Veitchii*, 'Phœbe,' *Regneri*, 'Revertons,' 'Bella,' *rubro-oculata*, and 'Butterfly.' The last-named is a magnificent long-stemmed variety which is at its best early in February.

On the south side of the glass-houses is the main walk which runs parallel with the fruit range and connects with the road leading into the Great Park. On each side of the road are large beds of Roses, 100 roses to a bed, in such varieties as 'General McArthur,' 'Ophelia,' 'Madame Butterfly,' 'Shot Silk,' 'Mrs. G. A. Van Rossem,' 'Mrs. A. R. Barraclough,' 'Queen Alexandra,' etc. Spaced between the Rose bed is an ornamental ironwork over which is trained climbing and rambler Roses—'Allen Chandler,' 'Chaplin's Pink,' 'Paul's Scarlet Climber,' 'Lady G. Colvin,' 'Emily Gray,' 'Albertine' and 'American Pillar.' Some 12,000 Roses are used in this scheme, and give a very bright display in late June and July.

The Kitchen Garden.—The ground cultivated for the supply of vegetables is about 25 acres, and there are also walled-in gardens for bush fruits, etc. The inner garden or square is divided down the middle, south to north, by a trim grass path 16 feet wide. On each side of this path is a herbaceous border 18 feet wide. At the back of this border runs a continuous arch, on which are trained dessert Apple and Pear trees, and these at blossom time are very beautiful. At the back of the border itself are planted rambler Roses, trained loosely to poles 6 to 7 feet high, then herbaceous plants graduate from back to front. These borders are brightened up especially for mid-June with large quantities of autumn sown annuals, such as *Godetias*, *Antirrhinums*, *Stocks*, *Sweet Peas*, *Salpiglossis* and *Dimorphothecas*.

Half-way down the path is a fountain of granite, surrounded by a border of *Nepeta Mussinii* interplanted with *Narcissi*. In the water are planted a variety of *Nymphaeas*, while hardy fish sport amongst

the plants. A wide gravel path divides the garden east to west, and each quarter is again divided by a row of fruit trees, making each plot of suitable size for rotation cropping.

Outside this walled square is another walled garden, 300 yards long each way and 50 yards wide: here are grown Raspberries ('Pyne's Royal,' 'Lloyd George,' 'Red Cross,' 'The Devon,' and 'Baumforth's Seedling'). Another walled garden contains 1,500 bush fruits of Gooseberries, Black and Red Currants, Blackberries, etc. The whole of this garden is covered from wall to wall with 1-inch mesh wire-netting as a protection against birds. This has the desired effect as far as the ripe fruit is concerned, but it may be of interest to record here that while it saved the ripe fruit crop the bushes suffered in another direction by the repeated attacks of caterpillars on the netted bushes, which necessitated several applications of insecticide. The bushes in the open showed no sign of attack by caterpillars.

On the south and west walls are planted Peaches and Nectarines; these give good crops as a rule, but much depends on the weather when the trees are in bloom. As a protection against frost we hang nets two or three times doubled down in front of the trees. In recent years we have adopted the system of lining the walls with a lattice-work of wood 3 inches from the wall. On to this the Peaches are tied, and the benefits we find are (1) fewer attacks by vermin, especially woodlice; (2) it permits a current of air to pass round the foliage; and (3) a considerable reduction in labour in tying compared with nail and shred fixing.

In the south-east corner of the garden is the frame ground, providing an acre of frames. Here are wintered 23,000 Geraniums for the bedding out at the East Terrace Garden at the Castle, which will be mentioned later; here also are grown early vegetables, such as forced Seakale, French Beans, Carrots, Salads, and Potatos. There are also frames for autumn-sown plants for the herbaceous borders to give a good display in June.

From the gardens we pass through the orchard, laid down in grass. Here, in the first week in April, are acres of Daffodils which have been naturalized in the grass. On a selected day, when the blooms are at their best, the whole of the staff is set to pick the flowers, supervised by Her Majesty; these are packed in boxes and hampers and despatched by road and rail to about fifty hospitals and charitable institutions in and around London.

Frogmore.—About half a mile from the gardens are Frogmore grounds, a delightful sheltered bird sanctuary and a stretch of water which winds in and out amongst the trees with an island at each end. At the north-west end of the ground is built the Mausoleum, the resting-place of the late Queen Victoria and her Consort Prince Albert. The Mausoleum was completed in 1866; the architects were Dr. Gruner and Mr. A. J. Humbert; the building is in the shape of a cross, the arms of which are of equal length, with the addition of the porch at the eastern side. Externally the breadth is 70 feet and the

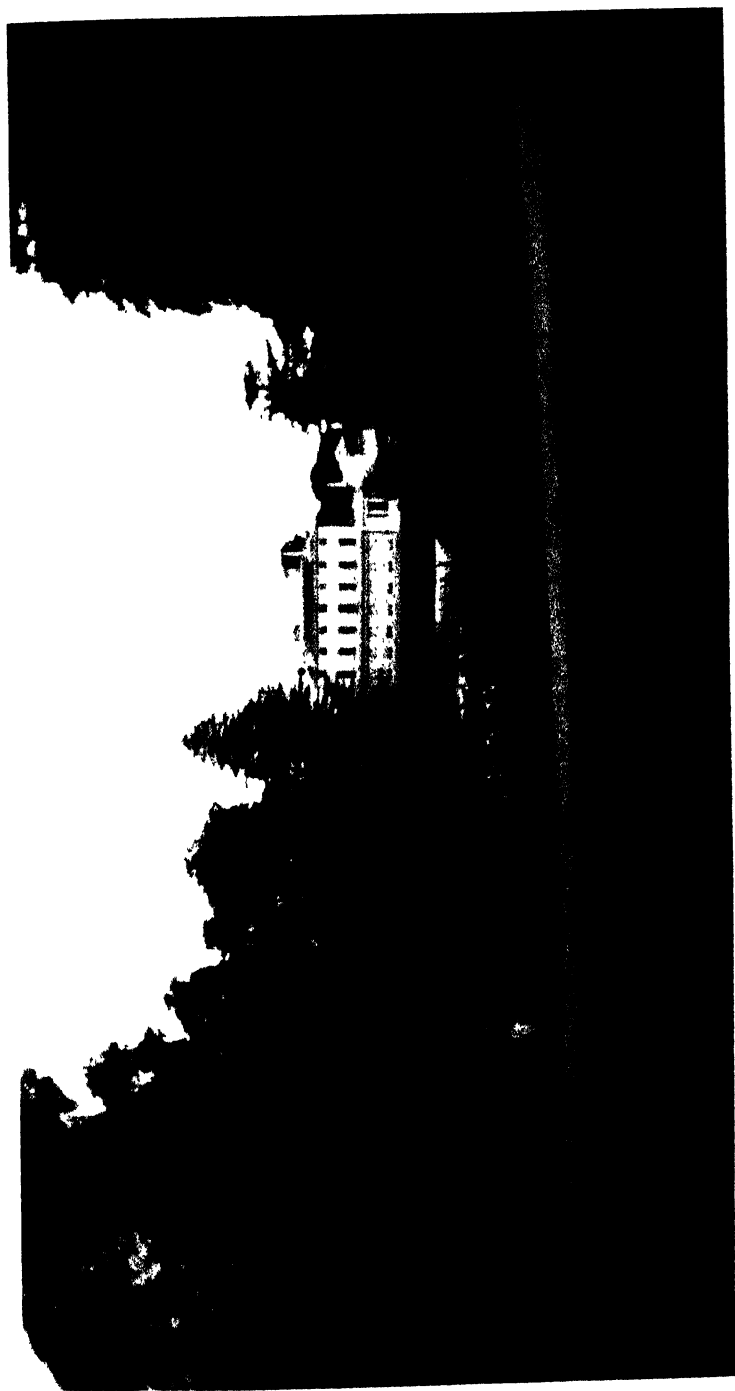


FIG. 52 - FROGMORE HOUSE

To face p 192.

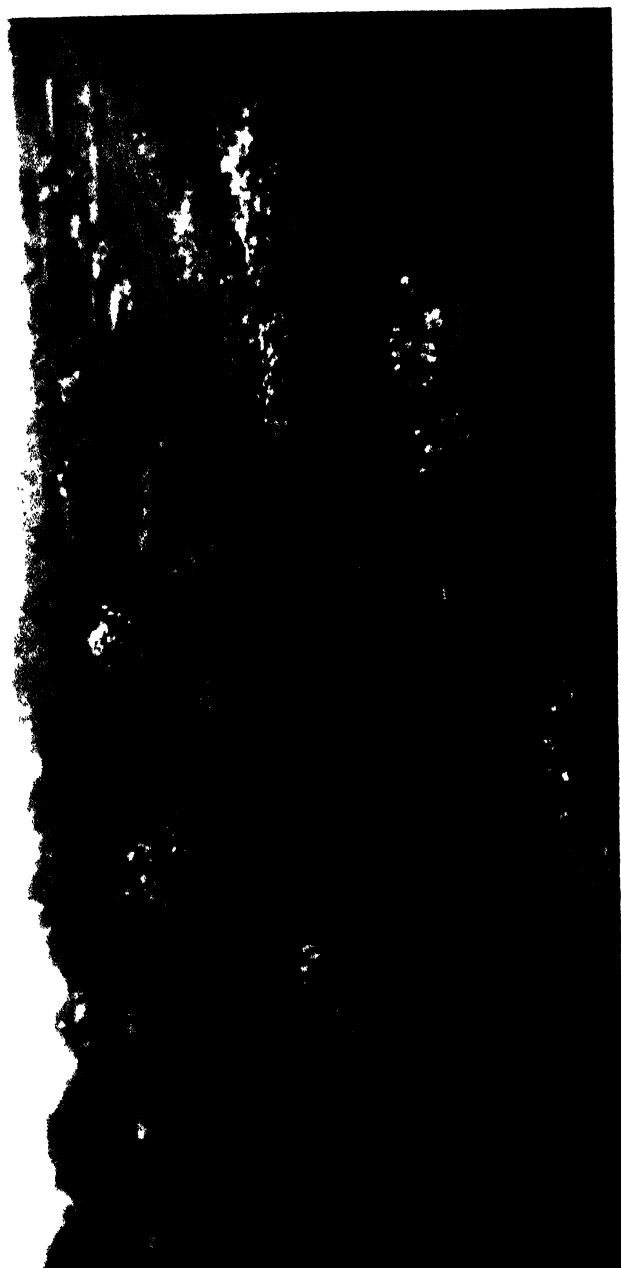


FIG. 53 - THE HERBACEOUS BORDERS AT FROMMORL

length is 80 feet. The extreme height is 83 feet. The interior is faced with marbles and serpentine, combined with frescoes and other decorations. The Mausoleum is open to the public on Whit-Monday of each year, when some 5,000 people pass round the sarcophagus.

In recent years much has been done to replace the old and worn-out Yews and Portugal Laurels with new and better-class shrubs. As the ground has been cleared and prepared such shrubs as *Rhododendron Loderi*, *R. Loderi* 'King George,' *R. Thomsonii*, *R. Fortunei*, *R. decorum*, *R. Griersonianum*, *R. calophytum*, *R. sutchuenense*, *R. Roylei*, *R. discolor* and *discolor* hybrids have been planted, as well as many seedlings from KINGDON WARD'S and GEORGE FORREST'S collections.

Amongst other shrubs are *Berberis aggregata*, *B. subcaulialata*, *B. Darwinii*, *B. Gagnepainii*, *Acer brilliantissimum*, *A. rubrum*, Azaleas in variety, *Buddleia Fallowiana*, *Exochorda macrantha*, *E. Wilsonii*, *E. Giraldui*, *Leptospermum Chapmanii*, *L. scoparium Nicholii*, *Magnolia Wilsonii*, *M. Soulangeana*, *M. Lennei*, *Catalpa bignonioides*, flowering Cherries (including 'Wabihito,' 'Watereri,' 'J. H. Veitch,' 'Serrulata,' 'Ama-no-gowa'), *Cornus alba elegantissima*, *C. florida rubra*, *Olearia Haastii*, *O. macrodonta*, *O. Gunnii*, *Styrax Obassa*, *S. Hemsleyana*, *Elaeagnus Fredericii aurea*, *Viburnum plicatum*, *V. Carlesii*, *V. macrocephalum*, *Eucryphia pinnatifolia*, *E. × Nymansii*, Forsythias, Cytisus, Genistas, and *Prunus Pissartii nigra*. These are but some of the recent additions. From time to time Their Majesties have been graciously pleased to accept gifts of trees and shrubs from, among others, Lt.-Col. Messel, the Countess of Hopetoun, L. de Rothschild, Esq., Sir John Ramsden, and the Directors of Kew and Edinburgh Botanic Gardens.

Amongst the older trees are two evergreen Oaks, reputed to be 1,000 years old. Their stems measure, at 5 feet from the ground, 24 feet in circumference, and have a branch spread of 140 feet; each limb is chained to its neighbour and so to the centre of the tree. The trees are in perfect health and vigour. Another fine tree is *Libocedrus decurrens*, which is 94 feet high. This tree was over 100 feet high, but a snow-storm destroyed 10 feet of the top; it was planted in 1857, and is a healthy and well-feathered specimen. *Aesculus indica*, one of the sixty trees presented to the late Queen Victoria by the Royal Horticultural Society on the occasion of her Diamond Jubilee in 1897, is a handsome tree of 50 feet in height and as far through. It is a picture of beauty in early July, when it is covered with pink horse-chestnutlike flowers. A hundred young trees of this variety are now available, with which it is hoped to make an avenue.

A very fine Beech, known as the 'Luther's Beech' at Frogmore, owes its name to the fact that it was grown from a shoot taken from the tree under which Luther was arrested in 1521 in the Duchy of Meiningen. The shoot was brought to England in 1825 and planted in Bushey Park by Queen Adelaide. It was replanted in Frogmore in 1840; it is a splendid specimen with an enormous branch spread, and

an attempt is now being made to layer some of the shoots. The Cumberland Lodge Vine is a fine old vine of the 'Black Hamburg' variety, and is 165 years old, or about ten years younger than the Hampton Court vine—in fact, it is supposed to be a shoot from the vine at Hampton. Its girth, at 3 feet from the ground, is 53 inches, and it covers a roof space of 4,600 square feet, and carries close on 1,000 bunches of Grapes each year, which are sent to hospitals and charitable institutions.

The East Terrace Gardens.—From the flower gardens which adjoin the Castle a splendid view can be had of the exterior of the east front. The Prince of Wales Tower to the north and the Victoria Tower to the south, with the Chester and Clarence Towers intervening, relieve the elevation, and the projecting windows prevent the solid masonry from appearing too heavy. The entire length of the front is 438 feet.

The Flower Garden, laid out by the direction of King George IV, forms a charming foreground. The fountain and statuary—part of which originally belonged to Hampton Court—are its most striking features. The bedding in spring consists of Wallflowers, bulbs, Polyanthus, Myosotis, etc. About 50,000 plants are grown for this display. For the summer bedding—which, by the way, must be completed by the first week in June, when Their Majesties entertain large parties for the Ascot races—a similar number of plants is required, but composed principally of pink Geraniums with dot plants of dwarf blue Delphinium semi-plena, edged with Lobelia. The borders are bedded out with annuals: Dahlias, Michaelmas Daisies, etc.

The retaining wall runs round the terrace in a half circle and is 750 yards long and 14 feet high. Here a collection of wall plants is planted, amongst them *Elaeagnus pungens aurea*, *E. pungens Frederici*, *Abutilon vitifolium*, *Pyracantha Gibbsii*, *P. Rogersiana*, *Actinidia Henryi*, *A. chinensis*, *Piptanthus nepalensis*, *Solanum crispum*, *Tricuspidaria lanceolata*, *Grevillea juniperina* and *G. rosmarinifolia*, *Hydrangea petiolaris* (which clings closely to the wall and is very effective when in bloom with large heads of white flowers), *Fremontia californica*, and a collection of Magnolias. At intervals along the wall are planted standard-trained *Prunus Pissartii nigra*, which flower profusely in advance of trees grown in the open, while in the summer the foliage gives a pleasing contrast to the grey walls and the dwarfer shrubs growing beneath.

A short walk across the golf course brings you to Adelaide Cottage, a delightful retreat built by desire of Queen Adelaide, wife of William IV. It is beautifully decorated and much used by Their Majesties and their guests. Roses, Kalmias and Rhododendrons make a brilliant display, while running from end to end is an oak pergola, on which is planted a representative collection of climbing and rambler Roses and other climbers.

Close by is a rockery which was made up from a disused chalk quarry—this rockery was figured in the Gardeners' Chronicle in 1874.

It has been recently overhauled and now contains a collection of Primulas close to the water-pool, while on the rockery and elevated portions thrive Saxifrages, Gentians, Leptospermums, *Rosa Roulettei*, Maples, Gorse, Alyssum, Aubrietia, and miniature trees. A winding path leads up to a grotto or summer-house, which commands a pleasant view of the river and large beds planted with *Salix britzensis* and *S. vitellina*.

The Home Park contains a well-kept nine-hole golf course, bowling green, cricket ground, and tennis courts, all maintained by His Majesty for the employees and their visitors. Most of the games are played at home, as the visitors enjoy the opportunity of visiting the Castle and St. George's Chapel, as well as playing the games in ideal surroundings.

SOME MARCH-FLOWERING MEMBERS OF THE PRUNUS FAMILY AT WISLEY.

By B. O. MULLIGAN.

THIS large "family" contains many plants of diverse habit and size, from small shrubs to large trees, which are of great garden value. Others not so worthy are still of some beauty or interest, and in this note it is proposed to mention some from both classes which have flowered in the month of March 1935 at Wisley. Periods of unusually warm weather during this month may, however, have brought into bloom some which do not usually open fully until April, such as, for example, *Prunus yedoensis*, *P. incisa*, and *P. subhirtella pendula*.

The earliest to produce their flowers are the type and various coloured forms of *P. cerasifera*, the Cherry Plum or Myrobalan, which itself is a tall tree scattered with snow-white blossoms, rapidly followed by the bursting green leaf-buds. The variety *Pissartii* (frequently misspelled *Pissardii*) has in the summer deep purple foliage, while the flowers are pink-blushed. This year they were borne in great profusion on the old trees between the Azalea and wild gardens and made a notable picture when seen across the pond from Seven Acres. Of the several other forms with dark coloured leaves, I would place *Woodii* and *nigra* foremost, because of the charming clear pink flowers, very much more decided and deeper in shade than those of *Pissartii*.

These varieties have not ceased flowering before the various Almonds are with us, and most striking of these commonly grown yet lovely trees is the variety named *Pollardii*, for which lately the President of the Society received a First-Class Certificate. At Wisley it comes into bloom earlier than the type, the flowers are larger, due to the broad, overlapping, rounded petals, while the colour is pale pink over all instead of being merely reddened at the base. In time this should everywhere supersede the common Almond, which flowers about a week later. Two others of this group are slower in producing their ornamental blooms—one is var. *macrocarpa*, which received the Award of Merit in 1932, and produces the largest flowers of this section, full 2 inches across, white with broad, oblong petals each having a deep pink suffusion at the base. The growth is rather tall and lanky, in contrast to the others which form bushy heads. Especially is this true of the semi-double variety, *Prunus communis roseo-plena*, where some of the stamens are replaced by petals and the whole flower is a uniform pink, about 1½ inch across. The buds are a deeper pink, and it is the last of the Almonds to flower, towards the end of March or in early April.

Early in the month, and it may open in February, *P. Conradinae* flowers. It is a Chinese species, which like so many others at this



FIG 54—"THE RUIN" IN THE GROUNDS AT FROGMORE

[To face p 196.



FIG. 55 THE PLANT CORRIDOR AT WINDSOR.



FIG. 56 CISTERNAS AND AMARYLLIS AT FROGMORT



FIG. 57 THE PLANT CORRIDOR AT FROGMORE

To face p 197.

season produces its masses of delicate, narrow petalled, pink-tinged blossoms on the bare branches ; the semi-double form, *P. Conradinae semi-plena*, is particularly delightful, and may be cut in late bud to open fully indoors. Another precocious species is *P. cantabrigiensis*, but in this the flowers are not so ornamental, though it is worth growing in a cool house for the sake of its unusually early red fruit. The young leaves when unfolding are crinkled, glossy, and of a wonderful bronze-red hue.

A plant allied to our garden plums and the Myrobalan is *P. Simonii*, from North China, known as the Apricot Plum from the resemblance in shape of its dark red fruits to Apricots. Named after its introducer, Eugene Simon, it was sent to Europe in 1867, but is only of value for the early appearance of the clustered white flowers on short spurs along the dark branches. The fruit is not of good quality. Upright in habit, at Wisley it has made a bush about 8 feet high.

Leaving the tree-like varieties, we come now to those which can be properly classed as shrubs, generally bushy in shape, tending to grow outwards with spreading branches and not upwards with a definite trunk.

Of these, *P. tomentosa* is by no means the least attractive, for in time it will form a large bush of 7 or 8 feet in height and as much as 10 feet in width. The flowers appear in the latter half of March, are small, pink-tinged in bud, white when open, but borne in such quantity along the branches, one or two at each bud, that the whole plant becomes a mass of blossom. The bees also are especially fond of these, so that it forms a valuable early source of food for them.

A rather similar species in habit and time of flowering, although less eager to increase in diameter, is *P. Jacquemontii* of the central and western Himalaya, at present a bush of 4 feet in height and diameter, with light grey bark on the young shoots. The small flowers appear when the leaf-buds are opening, at first deep pink, finally quite pale when expanded on their very short stalks. The blossoms atone by quantity, like the preceding species, for their lack of size, and form well-clad sprays of delicate colour.

P. japonica var. *Nakaii* is an allied species whose small pink-tinged flowers closely beset the young shoots. It does not seem to have any great vigour of growth, unless Wisley conditions are intolerable to its temperament.

P. baldschuanica should be mentioned, since it has produced its deep pink miniature Almond flowers this month, but so far has not given us any great quantity of them. It is an uncommon species and perhaps has not yet settled down to give its best. *Prunus humilis* is more of botanical than of garden interest, since the flowers are very small and not brightly coloured.

P. triloba var. *plena*, so frequently forced for early shows and house adornment, is a double pale pink flowering Plum of great beauty, but which does not always do itself justice in the open border and is apt to be tender. Probably it requires a wall to produce those long

branches well roped with the carmine-pink buds or inch-wide blossoms which we see in florists' shops, but those who have suitably sheltered gardens should not hesitate to plant it.

Of all the bushy-habited members of this great family none can surpass *P. incisa* in its high quality as a shrub for all gardens of every size. In growth it is usually compact and twiggy, 4 to 6 feet in height and width (though sometimes considerably taller), with numerous short, spreading branches. In late March or early April a myriad of pink buds unfold from the wrinkled dull crimson calyces, and open into nodding white-petalled flowers, coloured by the sepals beneath and the tiny pink spot at the base of each notched petal. In gardens of small area one or two specimens will suffice, and look particularly happy set in an area of lawn, but where space is plentiful groups of half a dozen will form an unsurpassable spring feature. The value of this shrub has been recognized by the bestowal of both the Award of Merit and Award of Garden Merit.

Finally, we come at the end of March or in the early days of April to two first-class small trees. One of these is *P. yedoensis*, or Yoshino as it is frequently known, which branches widely and grows so strongly that it soon forms a considerable head, therefore plenty of room should be allowed when planting. The large pale pink flowers dangle in trusses of three to five on long pedicels below the branches, appearing about the time when the leaf buds are unfolding. The wide petals overlap at the base, and the bees are frequent visitors to the blossoms. It is of Japanese origin, and possibly a hybrid.

The second, also Japanese, is *P. subhirtella*, and of particular note is the variety *pendula* in which the branches have a weeping habit. This should preferably be obtained in standard form about 7 or 8 feet high, so that sufficient space is available for the branches to droop earthwards. Like the preceding species, the leaf and flower buds open more or less together, and the combined effect of delicate pink petals and bronze-red leaflets is most charming. At this stage the old tree by the entrance to the Wild Garden at Wisley is one of the year's loveliest sights.

THE VOORHELMS OF HAARLEM.

By W. ROBERTS, F.R.H.S.

OF the many firms of bulb growers and exporters who, during the last two or three centuries, have brought fame to Haarlem from all over the world, only a few have become historical in the sense that their names are familiar to students outside Holland. These few exceptions owe their celebrity chiefly to the fact that they published catalogues dealing with their own special line in horticulture.

Now and then one, greatly daring, would publish a book on the mysteries of bulb growing ; but this was regarded as something in the region of a Fall from Grace, because the art or mystery of such matters was considered as a trade secret not to be lightly revealed. For generations the attitude of the bulb growers appears to have been this : We supply you with perfectly grown bulbs, but we do not undertake to teach you how to cultivate them ; if you fail that is your fault, not ours. One of the earliest of the Dutch firms to reveal the secrets of their success was HENRY VAN OOSTEN, whose Dutch Gardener or the complete Florist was first published (in English) in London in 1703, a second edition "with great Amendments," appearing in 1711, which long held its own as a standard work. The design of his book, VAN OOSTEN tells us, is "to serve the young Lover of Flowers, or those who are just commencing that pleasant Study" ; and he assures his readers that "if they follow the Path that is here chalk'd down, they will speedily get into the High road that leads to a Garden which in all Seasons of the Year will present 'em with such Objects that feast the Eyes and refresh the mind " and so forth. Some apology is perhaps necessary for bringing VAN OOSTEN into the picture, for he was of Leyden and not of Haarlem ; but so far as bulb growing is concerned probably the system in vogue at one place was not very different from that at the other.

The great difficulty in writing about the bulb growers of the eighteenth century is that they have left so little material for biographical treatment. They are, for the most part, mere will-o'-the-wisps or phantoms of floricultural history. It is probable that the names of most of these long-forgotten Haarlem growers are more or less fully recorded in the archives of that City. How very complete these records are likely to be may be inferred from A. VAN DER WILLIGEN'S exhaustive "*Les artistes de Haarlem*," published as far back as 1870. An artist hands his name down to posterity on his picture, the creation of his genius ; but there is no such means of perpetuating the results of the florist's skill in producing a fine Hyacinth or a superb Tulip, and even that production may have only a brief life. Even in cases where an artist transmits to posterity a new flower of exceptional beauty,

the artist's name is preserved whilst that of the florist who raised it is usually forgotten. Until such time as the Haarlem archives reveal their secrets, we shall have to rest content with printed catalogues and occasional books. Catalogues of bulbs, as of most other things, are the most ephemeral of all printed matter ; issued entirely for a passing purpose they are quickly out of date and consequently soon destroyed ; the most amazing thing is that any should have survived. We fully realize their historical value to-day, and such as have escaped destruction have found a permanent home in horticultural libraries, public and private, and it is largely upon them that we have to build up theories and construct hypotheses.

Of the many firms of Haarlem bulb-growers probably those which were the most familiar for the longest period to English nurserymen and amateurs were VOORHELM, VAN EEDEN and VAN KAMPEN. Without setting up any sort of comparison, it is with the VOORHELMS that I am now more particularly concerned. By the courtesy of a friend of over forty years, Mr. E. H. KRELAGE of Haarlem—the worthy son of a distinguished father who was also my friend—I am in possession of what may be called an epitome of the Voorhelm family and its ramifications so far as concern the bulb-growing trade. These annals take us back to the period of the Tulipomania * (1636–7), though the founder of the firm, DIRK JANSZ VOORHELM, is not mentioned in the pamphlets on the subject. This man came from the village of Vorhelm in Westphalia to Haarlem, where he married in 1637, where he seems to have settled as a bulb-grower and exporter, and where he was living in or later than 1690. His son PIETER VOORHELM, living also in Haarlem, married three times (1675, 1696, 1709), and his son SIMON VOORHELM is recorded as having married in 1706 TRIJNTJE SEELE.

PIETER VOORHELM appears to have been one of those fortunate men who acquire fame without working for it. It may be that the introduction of the double Hyacinth is still an unsolved problem, like the Man in the Iron Mask or the authorship of the Junius Letters but so far as the double Hyacinth is concerned the odds seem to be in favour of PIETER VOORHELM. The story is that PIETER was taken ill, and could give no attention to his plants until the Hyacinths were beginning to die off. A flower of unusual form arrested his attention, and examination proved it to be a double Hyacinth ; he cultivated it and multiplied it and was soon able to place it on the market, his customers willingly paying high prices for the bulbs. It seems to have passed out of cultivation long before 1678 ; but about 1698 two other double varieties were discovered : a single bulb of one of these, named ' Roi de la Grande Bretagne ' (in honour of " Dutch William "), is said to have been sold for 1,000 florins.

The most famous member of the family was PIETER's grandson,

* The best general, or at least most accessible, account of this extraordinary craze is to be found in BECKMAN's *History of Inventions, Discoveries, etc.* in Bohn's Standard Library, vol. 1, pp. 22–31, where the titles of a number of contemporary pamphlets and books are cited ; there may be other and fuller accounts in Dutch.



FIG. 58.—THE FRUIT HOUSES AND ROSE SUPPORTS AT WINDSOP



FIG. 59.—DATTODUS IN THE ORCHARDS AT EPOCANTON.

GEORGE (or JORIS) VOORHELM (1711-1787), who greatly extended the business and obtained a European fame by his Treatise on the Hyacinth, which appeared in English, French, Italian and German

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H Y A C I N T H,
Containing the
Manner of Cultivating that
Flower,

On the Experiences lately made

By GEORGE VOORHELM,

And according to the Method practised by
the famous Flowrists AALST VAN NIEU-
KERK and JAMES MOL and Co. at Haar-
lem in Holland.

Translated into English

L O N D O N,

To be had of Mr. BARTHOLOMEW ROCQUE
Flowrist at Walham Green near Fulham, at
Mr. JOHN ROCQUE Topographer to his Royal
Highness the Prince of Wales, at the end of
Round Court in the Strand, and at Mrs.
COOPER's in Pater-noster Row, and no where-
else.

MDCCLIII.

[Price 2s. 6d.]

FIG. 60.—FACSIMILE OF TITLE-PAGE OF FIRST ENGLISH EDITION.

translations—no Dutch edition was printed, though Mr. KRELAGE has a contemporary MS. of the Treatise in Dutch. The French version, *Traité sur la Jacinte*, was published at Haarlem in 1752, second edition 1762, third edition 1773—a copy of the first is in the Library of the Massachusetts Horticultural Society, and of the other two in the Lindley Library. The English edition, *A Treatise on the Hyacinth* (a little volume of 120 pages), was published in London, and was sold

by "Mr. Bartholomew Rocque,* Flowrist at Walham Green near Fulham, at Mr. John Rocque . . . at the end of Round Court in the Strand, and at Mrs. Cooper's in Paternoster Row, and no where else." The price was half a crown. I have a copy; apparently it is not in any of the great horticultural libraries. It claims to embody "the experiences lately made by George Voorhelm, and according to the Method practised by the famous Flowrists Aalst van Nieukerk and James Mol and Co. at Haarlem." It is, I think, the first published book on the Hyacinth. Mr. HARMAN PAYNE cites one (Leipsic, 1665,) under the name of J. C. OLEARIUS, but I have failed to trace this.

The little book was something in the nature of an innovation, almost indeed a scandal. It clearly did not meet with the approval of the author's fellow-tradesmen. He describes himself as "descended from Ancestors and Relations who for above one Century have solely applied themselves to the Culture of Flowers, and especially to that of the Hyacinth"; and that he could not resist the "pressing Solicitations of all the Virtuosi who have desired a Treatise on this Flower." But notwithstanding "the Utility of my Undertaking," he feared that many of his "Countrymen and Fellow-Fanciers will cast a stone at me" on the score that "none but a crack'd Brain would disclose to the whole World the Secret of his Country, which few people are in possession of, and which would otherwise have remained there." The way of the pioneer is always hard, often thankless and generally unprofitable; but it is quite certain that VOORHELM's public-spirited action, in the teeth of local disapproval, was handsomely rewarded, for it must have brought him many inquiries from amateur cultivators and in this way greatly increased his own business.

His neighbours and trade rivals could not but be aware of this; and one firm at least, NICHOLAS VAN KAMPEN & SON, was not long before the thirst for authorship entered into its scheme of things; in 1760 this firm published at Haarlem a *Traité des fleurs à Oignons*. This is almost certainly identical with *The Dutch Florist*; or a true *Method of Managing all Sorts of Flowers with Bulbous Roots*, of which two editions in English appeared in 1763 and 1764. The earlier of these was published at Newcastle-upon-Tyne, then and for long a great floricultural centre. A much better printed edition, of larger format, with directions concerning the Guernsey Lily added, was published in London by R. BALDWIN at the date given. I have both editions, but neither is, I think, particularly rare. The authors at least must have read with surprise and consternation the translator's contention that Englishmen now had it in their power, by following VAN KAMPEN's instructions, of seeing their own parterres adorned with native beauties "without squandering away English money upon Foreigners"!

* It is necessary here to correct an error in JOHNSON's *History of English Gardening*, p. 206, and copied apparently by all subsequent writers (including HARMAN PAYNE); there is no authority for the statement that it was "translated from the Dutch by Bartholomew Rocque," though it is possible he may have done so.

Without going into the history of the Hyacinth as a florist's flower, it is interesting to note how rapidly its cultivation increased during the second and succeeding decades of the eighteenth century. In VAN OOSTEN'S Dutch Gardener, 1711, already mentioned, less than four pages are devoted to the Hyacinth, whilst the Tulip takes up forty pages, and the Gillyflower nearly as many. In 1776 a London seedsman published a catalogue of over 1,000 named sorts of Hyacinths. This list, almost certainly the longest which had appeared in an English form up to that time, is to be found in ROBERT EDMEADES'S Gentleman and Lady's Gardener, published on April 4, 1776. EDMEADES was in business at No. 11 Fish Street Hill, opposite the Monument. The catalogue of Hyacinths extends from p. 93 to p. 116, is arranged in sections and classified according to colour; each item is described and priced. The prices vary from sixpence a bulb upwards—'Princess Gallitzin' and 'Princess Wilhelmina,' among the double reds, are respectively 15 guineas and 10 guineas. There was a black Hyacinth, the 'Flora Nigra,' the small roots being 10 guineas and the larger ones 20 guineas. It is obvious that no English tradesman could handle such a bewildering number, or describe them with such precision. Probably no one Haarlem grower cultivated anything like so many. The catalogue must have been supplied from some central source in Haarlem, EDMEADES converting the prices into English money, to which he added his own profit.* As the book was published in April, it gave English growers ample time to make out their orders for the autumn trade. Since writing the foregoing, I find that early in the eighteenth century MILLER stated that the Dutch gardeners had 2000 varieties in cultivation.

VOORHELM gives a classified list of about 300 varieties in his book. His fame had even extended to Scotland, for he is often mentioned in JAMES JUSTICE'S Scots Gardener's Director, 1754; JUSTICE twice visited Haarlem, and his passion for introducing new plants appears to have involved him in financial difficulties. But a far greater advertisement came VOORHELM'S way in 1768, when the MARQUIS MAXIMILIEN HENRI DE SAINT SIMON published anonymously a fine monograph in quarto, *Des Jacintes, de leur Anatomie, Reproduction et Culture*, published at Amsterdam, with an engraved title-page and 10 plates, exquisitely drawn and engraved by JACOB VAN DER SCHLEY (1715-1779). HARMAN PAYNE records this work but does not give the name of the author. This monograph appears to be the only work by M. DE SAINT SIMON, apart from a translation of *The Tale of a Tub*—he was a correspondent of HORACE WALPOLE—and it is extraordinarily well done. VOORHELM and his book on the Hyacinth are frequently mentioned, and a plan of one of his hyacinth beds in 1766 is given.

* The Dutch florists for many years united in publishing yearly a general catalogue of their bulbs. This was entitled *Groote Hollandsche Catalogus van de aller voortreffelijkste Bol-Bloemen*. I do not remember to have ever seen one of these catalogues listed by an English bookseller, and they must be excessively rare.

A careful search into the printed records of English visitors to Haarlem in the eighteenth century would almost certainly reveal many visits to the bulb grounds on the part of flower lovers. Dr. SHERARD,

M. L. Carr
at Stafford

Haarlem 1st Aug: 1794.

Lix

[illegible]

FIG. 61.—FACSIMILE OF LETTER-INVOICE FROM VOORHELM & SCHNEEVOOGT,
1774 (size reduced).

writing to Dr. RICHARDSON (DAWSON TURNER, Correspondence of Richard Richardson, 1835, p. 172) on September 7, 1721, wrote "We bought at Haerlem a great number of bulbs, which will soon increase." We have documentary evidence (now printed for the first time) (fig. 61) of a visit from another distinguished Englishman over half a century later, by which time GEORGE VOORHELM's daughter had married GOTTFRIED SCHNEEVOOGT, and the firm had become Voorhelm and Schneevoogt (apparently at one time the firm was Voorhelm and Van Zompel). The visitor in question was Dr. JOHN CARR

(1732-1807), who was headmaster of Hertford Grammar School, LL.D. of Aberdeen and translator of Lucian; he was of sufficient importance to be included in the Dictionary of National Biography, but a much more expansive account of him will be found in NICHOLS's Literary Anecdotes. He was a man of many accomplishments, but hitherto gardening has not been regarded as among them. In the summer of 1774 he found himself in Haarlem and on a visit to the far-famed bulb nursery of Voorhelm and Schneevoogt. The document takes the form of a letter-invoice and is dated Haarlem, August 5, 1774. It reads as follows:

SIR,—Some weeks ago, we profit'd of the honour of your visit; by that occasion we promis'd to send you some fine tulips, for a proof. Now being Busy to provide our English Curious men, we Remember'd our duty. in consequence we pack'd 30 tulips as under in a box mark'd J.C. Sending it by our factors at rotterdam at the direction of Messrs. Topping and Fenton, Seedsmen, thames street, London, our friends, which we pray, to direct it, by the best way towards Hertford at your direction.

Pray give us any advice of the receiving you'll oblige,

Sir,

Your most Humble servants,

VOORHELM & SCHNEEVOOGT.

As will be seen from the facsimile of the letter (fig. 61), six of the named tulips were at "½℥" each, 12 at "¼℥" and 12 at 2s. each, which with expenses to Rotterdam, duty and freight to London, totalled £7 12s. The firm of Topping and Fenton, seedsmen and cornfactors, will be found in the London Directories during the 1770's at 121 Upper Thames Street, which was at that period a favourite quarter for seedsmen and nurserymen. Apparently the account remained unpaid for over twelve months, and attached to the original letter-invoice is a Bill of Exchange (fig. 62), dated Haarlem, December 8, 1775, for £7 12s., and to be paid unto the order of Messrs. Rops and Coussmakers and addressed to Mr. J. CARR, at Hertford. Let us hope that Dr. CARR promptly discharged his liabilities. A third document, a printed one, but dated in ink, April 8, 1775, is also addressed to Dr. CARR. It is quite worth quoting:

SIR,—Taking the Liberty to Charge you with the present letter, it's with intention to Offer the new Catalogue of our Collection of Flowers, almost Perfection'd Equally to the Collection it-self. Pray to look upon it on a Gracious Manner, and if it please you to order some things; We'll Execute your orders on a Manner to Convince you of our Honnesty and exactitude, being

Sir,

Your Most Humble Servants,

VOORHELM & SCHNEEVOOGT.

As will be gathered from the letter-invoice quoted above, GEORGE VOORHELM and his son-in-law were in partnership in 1774, and almost

certainly some years earlier. VOORHELM died in 1787, and his grandson GEORGE VOORHELM SCHNEEVOOGT, who was born in 1775,* seems

Haeften 3 december 1775. for 7. 12

Not usance, pay this our Bill of Exchange unto the order of
Messrs Propos & Bouwmeesters, seven Pounds and twelve
shillings Sterling value in acct^l with the same. And
please it to notes for payment of a Box with Roots
of Tulips, sent in Aug 1774. by direction of Mr Topping
at London, without other & since from, Voorhelm Schneevogt

To Mr J. Carr
at Hartford.

FIG. 62.—BILL OF EXCHANGE DRAWN ON J. CARR, 1775

to have inherited the literary proclivities of his grandfather. His fame rests on the *Icones plantarum rariorum*; *delineavit et incidit Henricus Schwegman, scriptionem inspexit S. J. van Geuns, a folio*

* The date of his death seems to be uncertain. B. D. JACKSON, *Guide to the Literature of Botany*, p. 604, gives it as 1871, but that would mean that he was 96 years of age, which seems very improbable.

volume published at Haarlem, 1793-5, with 49 plates, all but one of which were coloured. Owing probably to the high cost, but still more to the continental upheaval immediately following the French Revolution, the publication was suspended and never resumed. It is a very rare book, and is among the desiderata of the Lindley Library. GEORGE VOORHELM SCHNEEVOOGT had one son, CARL GOTTFRIED VOORHELM SCHNEEVOOGT, who was born in 1802 and died in 1878, without leaving any descendants. The activities of the firm in 1798, 1801 and 1805 may be seen in their Catalogues of Dutch flower roots which the Lindley Library is so fortunate as to possess. The firm had its bulb gardens next to those of E. H. KRELAGE (1786-1855) in the Kleine Houtweg, and in 1837 Mr. KRELAGE bought these grounds and added them to his own—apparently what we should describe as the goodwill was not included in the sale of the property. The firm's trade, however, was continued by the Zocher family under the title of Zocher and Voorhelm Schneevoogt until the beginning of the present century when, after many changes, it finally ceased to exist.

We have a remarkably interesting view of the Haarlem bulb industry and of its numerous tradesmen in the autumn of 1817 in the *Journal of a Horticultural Tour* by a deputation of the Caledonian Horticultural Society, published at Edinburgh in 1823—the long delay between the visit and the appearance of the *Journal* being partly due to the illness of its editor, PATRICK NEILL. Haarlem and its bulb farms are described on pp. 167-212. The visit took place during the reign of GEORGE VOORHELM SCHNEEVOOGT. The *Journal* was evidently drawn up with great care and one hesitates to question any of the statements. But, according to my information, in 1817 VOORHELM as a surname had become extinct thirty years previously. Yet the *Journal* mentions (p. 187) visiting the flower garden and nurseries of MYNHEER VOORHELM, "the grandson of him who is so often mentioned in Justice's 'Scots Gardener.'" His collection of bulbs is described as very considerable but as not superior to some others in the immediate neighbourhood. Mr. KRELAGE suggests that this VOORHELM may have belonged to another branch of the family, and that his firm was known as Groenewoud, Voorhelm & Co. A few pages further on (pp. 190 *et seq.*) we have a long account of a visit to the "bloemistries" near the Wood of Haarlem, and among them that of "Mr. Schneevoogt formerly a partner of Mr. Voorhelm," and described as "one of the most extensive and best managed flower gardens of Haarlem." Reference is also made to the proprietor's botanical and horticultural library, which was rich in German publications "that are little known to the gardeners and orchardists of Scotland." It may be that SCHNEEVOOGT had a partner, and on the dissolution of the partnership his associate continued to carry on under the name of VOORHELM. Anyway SCHNEEVOOGT was not only the lineal descendant of VOORHELM, but it is also certain that he inherited his books.

Apparently the Scottish visitors did not visit the Krelage gardens

which at that time would not have been so extensive as some of the others. In 1814 E. H. KRELAGE purchased the nursery of the widow JACOBUS DE LANGE at the Kleinen Houtweg, which remained the headquarters of the business down to our own time. In the *Gardeners' Magazine* of 1830 the Krelage nurseries were pronounced "one of the best gardens of its kind at Haarlem." In 1837 the Voorhelm Schneevoogt gardens were added to those of Krelage, which at later dates also absorbed those of Van Eeden and Van Kampen. Both G. V. SCHNEEVOOGT and A. C. VAN EEDEN were Corresponding Members of our own Royal Horticultural Society, and both figure among contributions to London's Arboretum, 1838.

There is a very interesting chapter on the Hyacinth in THOMAS HOGG's *Treatise on the Carnation, etc.*, 1824. The Hyacinth was not dealt with in the first edition, as the author was "very little conversant" with its culture. A friend of his, who visited Holland in the spring of 1821, informed him on that subject; this friend "visited in succession the gardens of George Voorhelm Schneevoogt, of Henry Cornelis, of Theodore Storm, of H. Polman Mooy, and some others" (p. 232). A list is given with prices of over a hundred sorts, the highest, 15 gulden, being for the double yellow, 'Heroine.'

I may perhaps be allowed to add, in conclusion, that the books and documents mentioned in this article are on loan at the great International Exhibition at Heemstede and Haarlem, which opened on March 15 and will extend to May.

It will be seen that the story of bulb-growing at Haarlem has many ramifications, and that it is impossible to touch one without trespassing on another. The history indeed runs into four centuries. The general story has been told in many books and periodicals, but mostly from the popular point of view. What would be most welcome to students all over the world is a fully documented treatise on the lines of BUCKLE's *History of Civilization in England*, or MACAULAY's *History of England*. Any such history could only be compiled in Haarlem and by a Dutch scholar.



FIG 63 - RANUNCULUS CALANDRINIOIDES

To face p 268.



Fig. 64. ANAGALLIS COLINA

SOME ROCK PLANTS.

By F. C. STERN, F.L.S.

IN the last few years collectors have brought back seeds and plants from all the highlands of the world to adorn our rock gardens. Seeds have been collected from the highlands of Burma and Tibet, from Asia Minor, Greece and Spain, from the Atlas Mountains in Morocco, from incredible heights in Peru, from Chile and other parts of South America, and from the mountains of North America. The greatest credit is due to these collectors, who through all sorts of discomfort and hardship have gathered the seed so carefully that there has been ready germination when it got home. Many of these plants are new to cultivation, and many beautiful plants which have been known and lost have been reintroduced. After the collector has sent the seed home, it is then the turn of the gardener to raise it and to grow the seedlings. Owing to the care of the collector it is usually easy to raise the seed, but then comes the problem of how to grow the plants in the rock garden. The charm of raising new plants is to see them flourishing in the open garden ; it is a great adventure, and there is much reward in seeing a beautiful plant growing and flowering happily in the garden that came from, say, 16,000 feet in Peru or the high mountains of Tibet, or that was collected by oneself from fascinating places in the mountains abroad. H. J. ELWES used to tell me to try to raise at least three plants of a species: to put one where one's friends thought it would grow, one where you yourself thought it would grow, and one where no one thought it would grow ! There is much wisdom in this jest, for although the collectors' notes are of the greatest use, the climatic conditions of sun, rain and snow are so different in these islands compared with the plants' natural home that very often quite opposite conditions suit the plants in our gardens. The following notes on the behaviour of some of the plants lately introduced, or reintroduced, are given in the hope that they may be of value to other cultivators and an encouragement to adventure among new plants.

The Atlas Mountains in Morocco which have again in the last few years been searched for flowers is a fine hunting ground ; *Ranunculus calandrinoides* (fig. 63), which is indigenous to Morocco and grows at about 6,000 feet, is a delightful small plant for a hot sunny place in the rock garden ; the grey crinkly leaves and white flowers tinged with pink are attractive in March ; for the last three years it has been quite hardy in a hot sunny place in a stony moraine. Another charming plant from Morocco is *Chrysanthemum Mawii*, which flowers in the summer and autumn with red flowers, showing up well against the grey-green foliage. It grows anywhere in full sun, and although not really hardy, it seeds itself so readily that it is easy to pick up

seedlings in the autumn to grow on for another year. We are indebted to Lady LAWRENCE for this first-rate introduction. Perhaps the most attractive plant indigenous to Morocco that I have seen is *Narcissus Watieri*, a perfect little gem, a pure white *Narcissus* flowering in May, growing only 4 inches high. Mr. G. P. BAKER collected it and showed it at a R.H.S. Show. I should not really mention it as I have not yet flowered it in the open garden, but it grows at 9,000 feet in Morocco, so it should be hardy. *Anacyclus depressus* is another good rock plant from the high Atlas, a flat-growing daisy-like plant having white flowers with the back of the petals red. It likes a hot sunny place where the drainage is good, and it is perennial.

Iris tingitana var. *Fontanesii* f. *latifolia*, to give it its full title, is an *Iris* new to cultivation, which was collected by Major LAURENCE JOHNSTON in the high Atlas. Major JOHNSTON says there are several forms of this *Iris* and he considers that this form is the best. It certainly is a magnificent plant, growing about 3 feet high with deep blue flowers; it is perfectly hardy in the open garden and flowers every year, unlike *I. tingitana* type. There is a very pretty *Anagallis* which came to me from Morocco under the name of *A. collina* (fig. 64); I am doubtful whether this is the right name; it has brick-red flowers about $\frac{1}{4}$ inch in diameter, which cover the plant during most of the summer months. The leaves, which are small and rounded and of a bronze-green colour, are unlike the annual usually grown under this name. The Morocco plant is charming, and if covered by a glass during the winter will very often survive; it is easy to strike, but does not seed at Highdown.

Morocco is getting every year easier of access, so more good plants should be found and brought home from the Atlas Mountains.

If we cross over from Morocco back into the mountains of Spain, we shall find another and very beautiful mountain flora which is well known to botanists but largely unknown to gardeners. Mr. LOFTHOUSE, Dr. BEVAN and Dr. GIUSEPPI have been exploring these mountains. The late Mr. LACAITA, an authority on Spanish flora, used to tell me how many beautiful plants suitable for our rock gardens there are in these great ranges. *Linaria faucicolor*, collected by Dr. R. BEVAN on the Picos de Europa, is a fine garden plant; it makes a flat mat and is in flower most of the summer, with deep purple-blue flowers; unlike some of the *Linarias* it does not run, and so does not become a nuisance. It grows particularly well mixed up among other plants, such as the creeping *Veronicas* or the smaller *Heli-anthemums*. Mr. LOFTHOUSE has brought back several good plants; the one that fascinates me most is *Thymus membranaceus* (fig. 19), a delightful sweet-smelling little bush, growing 6 inches to 1 foot high, covered with white flowers in June. It likes a hot place in the sun, and grows well tucked in near a rock.

The mountains of the Balkan Peninsula and Crete have been visited frequently in the last few years, and many good plants have been reintroduced. There are many good *Campanulas* that come from

the different mountain ranges in the Balkans, all of them worth growing. Many of them are monocarpic and die after flowering, but they are so beautiful when in flower and so easy to raise from seed that they are worth a place in the rock garden.

First of all, the *Campanula* from Dalmatia with the jaw-cracking name *Campanula Poscharskyana*, with lovely blue flowers; this *Campanula* is a perennial, and grows rampantly in any position facing north, south, east or west, and should be given plenty of room. It seeds itself about the rock garden, but curiously enough I have never been able to collect good seed from it. Another charming little *Campanula* just as difficult as the former is easy is *C. Hawkinsiana*, from 6,000 feet on Mount Smolika in Albania, a charming little plant, flowering in June with deep blue flowers. I have no idea how it should be grown; one plant is still existing in the rock garden in a hot place in a crevice between two rocks. As soon as it is propagated, which does not seem to be easy either, I will try Mr. ELWES' formula.

There is a batch of monocarpic *Campanula* species: *C. Andrewsii*, *C. lyrata*, *C. Celsii* and *C. rupestris* which, from a garden point of view, are very much of the same type. They all die after flowering, all have pubescent lyre-shaped leaves, all like a sunny well-drained place, preferably at the base of a rock, and all seed freely. They come from different parts of Greece, and from a garden point of view are geographical forms of the same species. *C. Celsii* seems to be the easiest and seeds itself about the garden; it is very charming in the spring, with the white pubescent lyrate leaves growing flat against the rocks, and later on also when the plant is covered with flowers. *C. rupestris* (fig. 65) is not so easy and resents the wet in winter; this *Campanula* is smaller in all its parts, and the colour of the flowers is a less beautiful blue than the last, but it is well worth growing.

Another fine monocarpic *Campanula* from Greece is *C. incurva*, closely related to the last batch, but the leaves are not lyrate, and the end of the leaf is large and ovate; this *Campanula* likes the same situation as the other monocarpic species, but grows much larger, up to a foot or more in height, and has fine white flowers. It particularly likes to grow at the base of a rock. A most charming little *Campanula* which comes from the Island of Naxos is *C. calaminthifolia*, an annual only 2 or 3 inches high, covered at the end of June with little blue bells.

Three very attractive *Violas* come from this part of Europe, two from Crete and one from Greece, which are new to me. *Viola macedonica* (fig. 66) is a charming fellow with a fairly large flower, the lower petals yellow and the top ones deep velvet mauve; it flowers all the summer long. The two from Crete are *V. cretica* with pinkish flowers, and *V. aetolica* var. *saxatilis*, the nicest of them all, with a small yellow flower, which has a most delightful impish face. This *Viola* was given me by Mr. G. P. BAKER, the doyen of amateur collectors to whom so many of us are indebted for the beautiful plants he has introduced to our gardens from Greece, Crete and Asia Minor. These *Violas*,

which are so delightful and so useful for the shady or northern slopes of the rock garden, must be propagated either by seed or cuttings every year, otherwise they die out. They are worth some trouble. There are two more plants from Greece which, though not new, are seldom seen in gardens. My thanks for these are due to Mr. S. C. ARCHLEY. All those who are keen on the flowers of Greece are indebted to Mr. ARCHLEY for his many kindnesses. The first is *Cyclamen graecum* (fig. 67), quite the most attractive of all Cyclamens. It should not be planted, like *C. neapolitanum*, under trees, for it requires the hottest place in the rock garden among rocks. Here it will flower beautifully but, like all collected Cyclamen corms, it will take some little time to settle down. The leaves and flower-buds begin to appear about the first week in September; the flowers are much like *C. neapolitanum*, but bigger and of a deeper red towards the base of the petals; the leaves are most attractive, the deepest green with marble blotches, like velvet to the touch, and underneath deep red.

The second is *Mandragora autumnalis*, which NICHOLSON says is supposed to be the Mandrake mentioned in the thirtieth chapter of Genesis. The Mandrake has deep blue-violet flowers in autumn, standing up some inches above the crinkled broad leaves which lie flat on the ground. It should be planted where it is to remain, remembering Shakespeare's simile:

"And shrieks like mandrakes torn out of the earth
That living mortals hearing them run mad."

From Croatia comes a lovely little plant which though not new is very seldom seen: *Colchicum hungaricum* (once called *C. montanum* var. *croaticum*). It is described by Mr. W. T. STEARN in R.H.S. JOURNAL, vol. 59, p. 67. It is difficult to give full credit to these delightful plants unless one uses Farrerian language, and my superlatives are spent. This Colchicum begins to flower in February (in 1934 it began in December) and continues for about a month with delicate pink or sometimes white flowers. It is just delightful, and especially useful flowering at this early time of year. It is perfectly hardy and seems to like a position facing north, where it does not get too hot. Slugs adore it, but a handful of naphthalene crystals thrown over it once a week during January and February will keep them away.

Another European rock garden plant which is easy to collect on the mountains near Lautaret in the French Alps is *Silene acaulis elongata*. FARRER is eulogistic about it and gives it specific rank, yet it is seldom seen in gardens. It likes a northern aspect, and in this position appears to be easier to grow than the type. The flowers are larger than *S. acaulis*, of a darker pink, and stand up well away from the leaves.

There are so many beautiful rock plants from North America and Canada that it is difficult to know which to mention. The family of *Lewisia* are all delightful; Mr. F. MILLARD, who has done so much to



FIG. 65 —*CAMPANULA RUPESTRIS*.

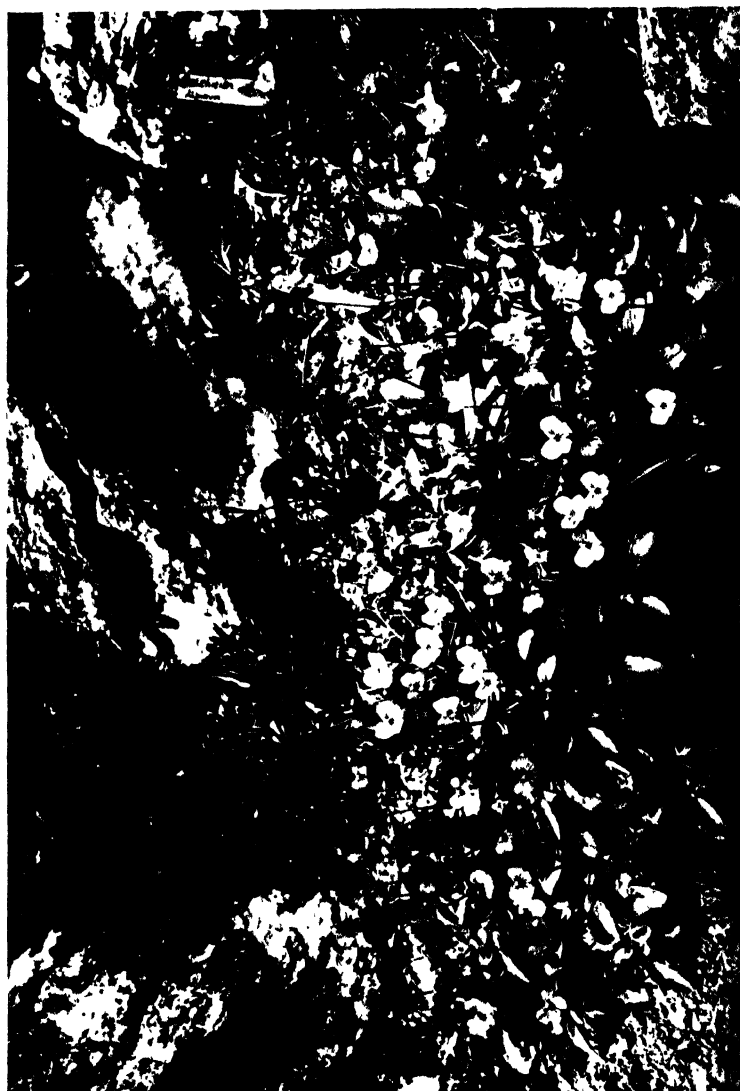


FIG. 66 — *VIOLA MACEDONICA*



FIG. 67 CYCLAMEN GRIMALDII



FIG 68 —PHILOX ADSURGENS

introduce them to gardens, grows them to perfection on his lime-free soil ; he has already described their cultivation. Then there are the American Phlox—all charming rock plants ; perhaps the best of all and the most beautiful is *Phlox adsurgens* (fig. 68), from the Cascade Mountains of Oregon. It forms an evergreen mat, and in June is smothered with light pink flowers. I found it very difficult at first to grow this plant and thought it was not hardy. Then we tried it on "the billiard table" in lime-free soil, and it grew famously and furiously as the photograph shows.

"The billiard table" is a raised bed held up by old railway sleepers containing lime-free soil, a mixture of peat and loam with plenty of sand thrown in. For those who live on lime soils, it is an easy and amusing way of growing the small Rhododendrons, the American Lilies and such plants as *Phlox adsurgens*. This Phlox is most useful as a ground cover for Lilies to grow through. In North America there are any number of good Violas that are worth growing in the rock garden ; one of the best is *V. septentrionalis*, a very easy plant to grow in half shade, and a plant very simple to propagate either by seed or division. The white flowers, which have the veins marked in blue, stand well up above the leaves, and the plants keep on flowering ; the flowers are useful to cut for the house and look charming in a vase. *Silene Ingramii*, a gorgeous plant from Oregon, is even better than *S. Hookeri* ; it is a stronger grower, and the flowers are larger and of a deeper red. The foliage is grey-green and the flowers of a gorgeous red. It seems to grow best in half shade facing west. These three plants are just three of the newer introductions from the wealth of rock garden plants in North America.

We will now pass on to South America, to Peru, to Chile, the Argentine and Patagonia. Miss STAFFORD has lately been collecting at great heights in the Peruvian mountains ; the seed she has brought home has germinated well, but it is yet early to say which of the plants will accommodate themselves to British gardens. A yellow annual *Bidens triplinervia* grows well in a sunny moraine and seeds itself profusely. It is a useful plant, as it begins to flower in late summer and continues until it is cut down by frost. Miss STAFFORD startled the gardening world with her description of the Scarlet Gentian, which has the embarrassing name of *Gentiana scarlatina*. This Gentian flowered in the garden this summer, but the flowers never opened. A gardening friend told me the flowers opened at noon for a short time, so I hurried round at 12 o'clock, but there was no sign of the flower opening ; then afterwards remembered it was summer time, but even at the old noon the Gentian did not respond. There is no doubt that it takes time to learn how to grow plants from different climates with such different conditions, or is it perhaps that the plants accommodate themselves to our conditions ? It is, however, a fact that *Meconopsis* and *Nomocharis*, and other plants which were not long ago considered nearly impossible to grow, are now thought to be not so very difficult. So I am looking forward to a mass of Scarlet Gentian on some rock

garden one day. It seems to like a northern aspect better than a southern one. The Malvaceous plants from Miss STAFFORD's expedition did not do well because they disliked our wet conditions in winter.

From the Chilean Argentine border several new *Calceolarias* have been introduced by Mr. H. F. COMBER suitable for rock gardens, and also another first-class plant, *Triptilion spinosum*; the latter has dark green deeply cut leaves, and a mass of small bright Eton-blue flowers, appearing in July and August when flowers are scarce in the rock garden. It is most attractive and extremely easy to propagate. In the autumn after the plant has flowered fresh tufts of leaves are made round the old stock; if these are dug up in November and pulled apart and put in a box of sandy loam in a frame, they will make excellent plants to put out the following spring. It is perfectly hardy here.

Two of the *Calceolarias* collected by Mr. COMBER do well in the garden—*Calceolaria crenatiflora* and *C. biflora*; the former comes from a much lower altitude than the latter, so is not so hardy; it has rather large leaves with flower spikes about 6 inches high, with a yellow *Calceolaria* flower spotted red, very attractive for a half-shady place, not too dry. *C. biflora*, on the other hand, likes a sunny place and seems to enjoy hugging the edge of rocks. It has yellow flowers and continues to flower over a long period. In time the plant increases and gets somewhat congested and needs dividing. Both these *Calceolarias* seed freely. Mr. CLARENCE ELLIOT introduced the very extraordinary and attractive *C. Darwinii*. The curious yellow flower of this *Calceolaria*, with an enormous mouth crossed by a broad white bar, reminds one of a dwarf with a huge head and is great fun. I have never been able to keep it through the damp of the winter, although it is said to grow in damp places in Patagonia, but perhaps it is covered with snow there in winter. In Country Life of December 15, 1934, there is a fine photograph of clumps of this *Calceolaria* in full flower in Mr. HARLEY's garden in Scotland. *C. tenella* is another South American; though not a new introduction, for it is said to have been introduced in 1873, it is uncommon in gardens. It has very small leaves with small clear yellow flowers rising about an inch above the foliage. It grows best planted at the base of a rock in the shade in rather damp surroundings in the same sort of place as *Arenaria balearica*; often after the winter the plant that is growing on the rock is the only part left, but as the days get warmer it roots down into the soil again.

Mr. T. HAY introduced *Nierembergia hippomanica* from South America—a very good rock plant. It is evergreen, growing some 10 inches high with large mauve cup-shaped flowers continuing all the summer long. It strikes freely and seems to be hardy. The plants are growing well on a hot ledge of the rock garden facing south. It is one of the best of Mr. HAY's many fine introductions. *N. frutescens* (fig. 69) is another good plant and far hardier than it is usually con-

sidered. It is a shrub growing up to 2 feet in height ; it is, however, so floriferous and beautiful that it can be used with advantage in the rock garden. It seeds freely and can be easily propagated from cuttings.

Again going westward across the Pacific we reach the mountains of New Zealand. The shrubs and trees of New Zealand have been grown for many years in these islands, but it is seldom that one comes across the rock plants from that country. Some are very difficult, like *Ranunculus Lyallii*, and the *Celmisias* are none too easy, but there are several very fine plants which do well in our gardens. *Ranunculus lobulatus*, a giant buttercup with broad leaves and large yellow flowers, seems to like a cool aspect. *Gentiana bellidifolia* is a delightful plant ; the flowers are white, cup-shaped, and the flower-stems are a dark brown, which looks black and sets off the flowers. It prefers full sun and, like most of the *Gentians*, a rather acid soil : a most attractive plant and well worth growing. Another New Zealander is *Wahlenbergia Matthewsii*, a very delightful harebell growing about 8 inches high with terminal white flowers flushed with pale blue. It sometimes goes through the winter, but usually must be treated as an annual ; as it seeds freely there is no difficulty in raising it. This plant was found in 1905 by Mr. H. S. MATTHEWS, a well-known horticulturist of Dunedin, N.Z. In 1915 Mr. B. C. ASTON found it again in the foot-hills of the Kaikura mountains, and seeds were eventually introduced to the Alpine Garden at Wadestown, New Zealand, and from there seeds were sent to me by Mr. ASTON in 1929. There are many more beautiful rock plants in New Zealand which should be tried in our gardens.

On our journey round the world we next come to the mountains of Western China, Tibet and the Himalaya, the home of so many wonderful plants that are hardy in this country. The Asiatic *Gentians* have prolonged the beauty of our rock gardens far into the autumn and have been fully described by Mr. MUSGRAVE and Mr. MILLARD in vol. 57 (1932) of the R.H.S. JOURNAL. *Gentiana Lawrencei* is not mentioned in these articles ; this *Gentian* is very attractive, with narrower and longer flowers than *G. sino-ornata* ; the flowers are of a lighter blue than *G. sino-ornata*, but darker than *G. Farreri* ; it hybridizes freely, in fact, rather too freely, and so is difficult to raise true from seed. The original plants are said to have been collected near Lake Baikal in Siberia, over a thousand miles away from Shugden Gumpa in Tibet, where Captain KINGDON WARD has been collecting on his last expedition and has seen hillsides covered with different forms of *Gentians*. This leads one to think that the mountains throughout all these many miles of Central Asia from Shugden Gumpa to Lake Baikal will be found to contain many more species of *Gentian*.

The many beautiful *Primulas* that come from these mountains add tremendously to the beauty of the garden, though most of them are more suited to the water-side. There are some, however, that require drier conditions and do well on the rock garden. *Primula*

nutans, with flowers of a delicate powder blue, is said to be difficult and not hardy. It appears to grow best in a peaty mixture in full sun. In fig. 68 it can be seen growing near *Phlox adsurgens* under the same conditions in "the billiard table." Here it has been perennial and is making good clumps.

Another lovely new *Primula* from Nepal is *P. sonchifolia*, first flowered in this country by Mr. T. HAY in 1931. It is yet a question whether it will be as accommodating in our gardens as *P. Winteri*. So far the plants at Highdown are alive and plumping up to form their new flower buds. The difficulty in growing *P. Winteri* is to keep it cool enough in our hot summers. It has never been killed here in winter, but in the hot summer of 1934 the plants died in spite of watering. *P. Winteri* seems to grow best in a fat kitchen-garden soil in shade. Farrer introduced the attractive and curious *Primula borealis* var. *Loczii* from Kansu. In his notes FARRER says it was growing in cool grassy situations on the fringe of woodlands. This very curious *Primula* has runners above ground rather like a strawberry, and these runners rooting form new plants some 3 inches away. A half-shady place which is not too wet suits it best.

Primula chungensis is another very pretty yellow *Primula* which likes the same conditions and does not mind lime, and seeds itself about anywhere in half shade. This *Primula* was introduced by Captain KINGDON WARD from his Tsang Po Gorge expedition to Tibet in 1924. He brought home from that expedition many beautiful new *Primulas* and the wonderful *Meconopsis betonicifolia*. It is strange to think it is only ten years since the seed of this glorious plant was brought home. Another *Primula* from that expedition was *P. Florindae*; in the collector's notes it is described as growing in shady bogs where water is running. It grows here in a pond with the neck of the plant well above the water, but its roots always in the water. This is an attractive way of growing it, but it increases so furiously in such a position that it must be divided periodically. *Meconopsis* are nearly all indigenous to these Asiatic mountains. Only a few are suitable for the rock garden; *M. quintuplinervia* is quite charming on the slopes of the rock garden facing north; it forms fat clumps in a rich neutral soil; the slate-blue coloured poppy flowers hang down from stems 2 feet high. FARRER, who brought it home from Kansu, called it the Harebell Poppy. Some of the new *Meconopsis* from Nepal make the most beautiful winter decoration for low places on the rock garden when it is difficult to find plants to make the rock garden amusing and attractive. *M. Dhuojii* is quite beautiful in winter, forming flat rosettes of deeply divided dark purple-green leaves covered with bristles; these bristles hold moisture like drops of dew all over the plant, and the effect is a perfect lace design which glistens in the winter light. Another Nepal *Meconopsis* came to me under the number 365, and might be a form of *M. napaulensis*; this plant is also beautiful in winter, forming large clumps; the leaves are covered



FIG. 69 NIEREMBERGIA FRUTESCENS



FIG 70 — ANEMONE RUPICOLA

with grey-white hairs which also hold drops of moisture. This plant has not yet flowered at Highdown. I often wonder if *Meconopsis* will not stand more sun than they are usually given. *Meconopsis* No. 365 was planted out in a place facing south-west, where the sun shone on it most of the day; it never looked back during the heat of the summer of 1934, and has grown into large clumps with only occasional waterings during that very dry summer. *M. regia*, also from Nepal, forms beautiful rosettes in winter but grows too big for most rock gardens.

One of the most charming rock plants from China is *Anemone rupicola* (fig. 70). It is seldom seen in gardens though easy to grow from seed. The glistening white flowers grow about a foot high, with attractive bronze foliage and flower in April. It will grow either facing north or south, though in a sunny position it seems to die out after a few years. The right position is probably somewhere facing west, where it is shaded from the morning sun.

The genus *Cyananthus* comes wholly from the mountains of the Himalayas, Tibet and Western China, the largest number of species coming from Yunnan in China. The largest flowered form and the easiest to grow in this garden is KINGDON WARD's form of *C. lobatus* from the 1924 expedition to Tibet, which has now, I believe, been given the varietal name of *insignis*. The Himalayan form of *C. lobatus* is a nice rock plant with slate-blue flowers, but the variety *insignis* has flowers about three times the size and grows easily among the *Primulas* in some shade. *C. longiflorus* comes from Lichiang in Western China, and is also attractive with silver-grey tomentum underneath the leaves and a long narrow flower. *C. integer*, from Kumaon in the Himalayas, is another pretty *Cyananthus* worth growing, with blue flowers in autumn. It grows beautifully in the rock garden at Wisley. None of the species of *Cyananthus* are very easy to keep in the garden; they do not seem to like the damp of our winters. Their homes are high up on the mountains, where a blanket of snow keeps them warm and dry all the winter. They are valuable as late summer flowering plants and very attractive when in flower, but a word of warning should be given against putting them near any of the autumn-flowering *Gentians*. The deep blues of the *Gentians* completely eclipse the slate blue of the *Cyananthus*.

There is no space to mention the many other beautiful rock plants from China and Tibet, so let us go once more westward to the mountains of Abyssinia on our way home to Europe. *Kniphofia Galpinii* from Abyssinia is a most perfect autumn plant for the rock garden. It does not seem to be at all fastidious as to soil and grows easily in a well-drained sunny place. The narrow green leaves with delicate red poker flower spikes going up to 2½ feet make a charming picture on top of a bank. *Delphinium Welbyi* is another good plant from Abyssinia; it grows some 2 feet high with attractive light blue flowers. No doubt some day many more beautiful flowers will be introduced from the mountains of Abyssinia.

TULIP SPECIES OF RECENT INTRODUCTION.

By Sir A. D. HALL, F.R.S.

ON March 19 the John Innes Horticultural Institution exhibited plants of four species of Tulips which have not previously been seen at Vincent Square. The following notes on them by Sir A. D. HALL, F.R.S., will, we feel sure, be found of interest and value.

Tulipa cypria Stapf is a slender Tulip of medium height which was first received from Mr. M. T. DAWE of the Agricultural Department of Cyprus. It is described by Dr. STAPF in the Bot. Mag., t. 9363. It belongs to the widespread variable group, with woolly-coated bulbs and a red flower with a black central blotch, to which the specific name *T. montana* is commonly given, but more properly should be associated with *T. oculus-solis* (see Gard. Chron. 95, 406-8, 424-5). Its distinctive feature is the deep claret colour of the perianth instead of the usual scarlet or crimson. The blotch is roughly circular, black, and bordered with a narrow zone of pale yellow. Usually the tips of the perianth segments remain green even when grown under glass. As is usual with bulbs of this group brought from their warm habitat, it starts into growth early, before the New Year, and is easily damaged by frost later; but seedlings may prove better acclimatized.

Tulipa Stapfii Turrill belongs to the same group of scarlet Tulips with woolly-coated bulbs, but possesses broad leaves starting at ground level instead of the slender upright growth of the previous species. The flower is large, with broad perianth segments, of which the outer are long and pointed, while the inner are broad and incurved. The blotch is starry, deep purple or black, and lacks a yellow margin. This species was found in Upper Iraq by Mr. ROBERT CECIL and first cultivated by Lady ROCKLEY. At first Dr. STAPF identified it with his *T. cuspidata*, a name which has been abandoned for reasons of priority (see Turrill, Bot. Mag., t. 9356). It grows strongly and increases freely.

Tulipa Micheliana Hoog is a Central Asiatic Tulip from Turkmenistan, introduced into commerce by Messrs. VAN TUBERGEN. Of medium height and growth, the leaves often carry dull purple lines on a glaucous ground which fade with age. The flower is brilliant crimson-scarlet, distinguished by a black central blotch with a broad margin of yellow, the points of which extend to more than half the length of the segment. This species belongs, not to the woolly-coated group, but to the group of Asiatic Tulips represented by *T. Eichleri*. It is a weak grower, difficult to preserve.

Tulipa chrysantha Boiss.—The specimens exhibited were collected by Col. J. W. THOMPSON GLOVER from the Kurram Valley on the confines of Upper India and Afghanistan. They are distinguished by

the brilliant crimson of the backs of the outer perianth segments, the inner surfaces being a fine yellow. *T. chrysantha* is closely related to *T. stellata*, inhabiting the same region of Afghanistan, Upper India and Kashmir. Indeed the two species seem to merge into one another, though the clonal forms in cultivation are distinct. They are tetraploids; a smaller yellow Tulip has recently been obtained from Kashmir which is a diploid and probably the origin of both *T. chrysantha* and *T. stellata*. The tetraploid form of *T. Clusiana* grows in the same region and is very intimately related.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

Cattleya × '**Titrianae**,' '**Old Dog Kennel var.**' A.M. March 19, 1935. From M. L. Wells, Esq., Chiddingfold, Surrey. (C. × '**Tityus**' × C. *Trianae*.) Large rosy-mauve flowers, the wide labellum crimson-purple, frilled at the margin.

Cyclamen persicum. A.M. March 19, 1935. From Major F. C. Stern, Goring-by-Sea. C. *persicum* has long been cultivated in British gardens and is illustrated at t. 44 of the Botanical Magazine (1788). Its dainty white flowers vary somewhat in size and in the colouring of the 'eye,' and some are pleasantly scented. The plant exhibited was grown from a corm collected in Palestine. It is not hardy.

Cymbidium × '**Adelma**' var. '**Springtime.**' A.M. March 19, 1935. From Lionel de Rothschild, Esq., Exbury. (C. × '**Letty**' × C. × *Lowio-grandiflorum*.) Large flowers of ivory-green colour, labellum spotted with red.

Cymbidium × '**Eagle**' var. '**Monarch.**' A.M. March 19, 1935. From Messrs. H. G. Alexander, Tetbury. (C. *Alexanderi* × C. × *Gottianum*.) Large blush-pink flowers, the labellum lightly spotted with rose.

Cymbidium × '**Louis Sander**,' Exbury var. A.M. April 2, 1935. From Lionel de Rothschild, Esq., Exbury. *Alexanderi* × '**Ceres**.' Spike of five well-formed flowers, rose-pink, the front lobe of the labellum much marked with crimson.

Cymbidium × '**Lyoth**' var. '**Rösy Morn.**' A.M. March 19, 1935. From Messrs. Stuart Low, Jarvis Brook. (C. × '**Ceres**' × C. *insigne*.) The chief attraction is the rich crimson-red labellum.

Cymbidium × '**Madonna**' var. '**N. Prinsep.**' A.M. March 19, 1935. From N. Prinsep, Esq., Pevensey. (C. × *Alexanderi* × C. × '**Memoria P. W. Janssen.**') Of light blush-rose colour, the labellum pinkish, margined with rose.

Cymbidium × '**Madonna**' var. '**Snowdrift.**' A.M. April 2, 1935. From N. Prinsep, Esq., The Boxes, Pevensey Bay, Sussex. (*Alexanderi* × '**Memoria P. W. Janssen.**') Spike of eight flowers, blush colour with a light pink tint on the front of the labellum.

Cymbidium × '**Susette.**' A.M. March 19, 1935. From Messrs. McBean, Cooksbridge. (C. *insigne* × C. × '**Magali Surprise.**') Deep crimson-rose, the whitish labellum spotted with red.

Cymbidium × '**Swallow**' var. '**Phantasy.**' A.M. April 2, 1935. From Lionel de Rothschild, Esq. *Alexanderi* × *Pamolsii*. Spike of seven cream flowers, the sepals tinged with green, the labellum marked with crimson.

Dahlias. See p. 226.

Erica australis. A.M. March 19, 1935. From Mr. John Heal, Budleigh Salterton. A pretty species of free growth, from S.W. Europe

and N.W. Africa. The leaves are in whorls of four; the cylindrical, rosy-purple flowers in dense clusters at the tips of short, lateral growths. *E. australis* is less hardy than species of more northern distribution and merits a site which affords some shelter, but is then a very decorative species.

Forsythia intermedia spectabilis. F.C.C. April 2, 1935. From Mark Fenwick, Esq., Stow-on-the-Wold. This most handsome of spring-flowering shrubs possesses many desirable qualities. It is extremely floriferous and of rapid growth and pleasing habit. Propagation presents no difficulty. This variety received the Award of Garden Merit in 1923, and is discussed in the R.H.S. JOURNAL, vol. 48, p. 226.

Iris basaltica. A.M. April 2, 1935. From Mrs. Tracy, High Hall, Wimborne. A new species of the *Oncocyclus* section, in habit and colour not unlike *I. Susiana*. The flower is large and globular in outline. The ovate, pointed falls are slightly incurved, the standards broad and arching. The whole flower is of a warm grey heavily spotted and veined with blackish-purple.

Iris Winogradowii. A.M. March 19, 1935. From Major F. C. Stern. This very desirable yellow-flowered species received the Preliminary Commendation on March 8, 1932, and is described in the JOURNAL, vol. 58, p. 25. It has proved quite hardy: the plants exhibited were grown in the open and the delicate flowers had survived the recent cold spell undamaged.

Kalanchoe Blossfeldiana. A.M. April 2, 1935. From Messrs. Clarence Elliott, Stevenage. An ornamental and free-flowering plant well adapted to pot cultivation in the greenhouse. It is of compact growth, bearing fleshy, ovate-spatulate leaves and dense, flattish clusters of small scarlet flowers on slender terminal and axillary stalks. This plant has been grown as *Kalanchoe globulifera* var. *coccinea*.

Leucocoryne lxioides odorata. F.C.C. March 19, 1935. From Messrs. C. Elliott, Stevenage. This attractive bulbous plant was given the Award of Merit on March 26, 1929, and is described in the JOURNAL, vol. 55, p. 47.

Magnolia Sargentiana. F.C.C. April 2, 1935. From Lt.-Col. L. C. R. Messel, O.B.E., Handcross. A deciduous tree introduced by Wilson from Szechwan and first flowered in this country at Caerhays in 1931. The leaves are obovate, 4 to 8 inches long, dull green above and grey-tomentose beneath. The flowers expand on leafless shoots, and consist of about fifteen oblanceolate segments up to 5 inches long, pale pink inside and rosy-mauve externally, enclosing a cluster of carmine stamens.

***Narcissus 'Boswin.'** A.M. March 5, 1935, as a variety for cutting from the open for market. A bi-color trumpet variety (Division 1c). Vigorous. Stem 18 inches, thick. Flowers well posed. Perianth $3\frac{1}{4}$ inches diameter, segments overlapping one-third of their length,

* After trial at Gulval, Cornwall, where the plants were inspected on February 28, 1935.

very wide at the middle and pointed, sulphur white. Corona $1\frac{1}{2}$ inch wide and $1\frac{1}{2}$ inch deep, expanded, sulphur yellow. Mouth expanded with reflexed crenate margins. Bulb medium size. Fairly free flowering. Flowering dates—1933, March 5 to April 2. 1934, March 8 to April 8. 1935, from February 2. Raised and sent for trial by Mr. P. D. Williams.

Narcissus 'Caerleon.' A.M. April 2, 1935, as a show flower, from Mr. J. L. Richardson, Prospect House, Waterford. A well-formed *Incomparabilis* variety (Division 2a) with stout 20-inch stems. Perianth segments broad, overlapping, smooth, pale primrose. Corona funnel-shaped, about half length of perianth segments, orange-cadmium. Raised by Miss Evelyn.

***Narcissus 'Duncan.'** A.M. March 5, 1935, as a variety for cutting from the open for market. A Leedsii variety (Division 4a). Vigorous. Stem 21 inches, thick. Flowers well posed. Perianth 4 inches diameter, segments overlapping for two-thirds of their length, very wide and flat, sulphur yellow. Trumpet $1\frac{1}{2}$ inch wide, $1\frac{1}{2}$ inch deep, primrose yellow. Mouth straight, frilled with reflexed margins. Bulb medium to large. Free flowering. Flowering dates—1933, March 4 to April 1. 1934, March 15 to April 10. 1935, from February 14. Raised and sent for trial by Mr. P. D. Williams.

***Narcissus 'Forerunner.'** F.C.C. March 5, 1935, as a variety for cutting from the open for market. A yellow trumpet variety (Division 1a) raised by the Rev. G. H. Engleheart and sent for trial by Mr. P. D. Williams, Lanarth, St. Keverne. A.M. as a variety for cutting from the open for market on March 20, 1934. See vol. 59, p. 485.

Narcissus 'Fortune's Sentinel.' A.M. March 5, 1935, as a variety for show from Mr. R. F. Calvert, Coverack, Cornwall. An *Incomparabilis* variety (Division 2a) with neat well-formed flowers of medium size borne on long stems; the broad, overlapping, smooth segments pale sulphur; the shapely cup, just over half as long as the segments, rich orange. Raised by the Brodie of Brodie.

***Narcissus 'Messina.'** A.M. March 5, 1935, as a variety for cutting from the open for market. A bi-color Barrii variety (Division 3b). Vigorous. Stem $21\frac{1}{2}$ inches, thick, strong. Flowers well posed, slightly drooping. Perianth 4 inches diameter, segments overlapping half their length, very wide and recurving, slightly pointed, sulphur white. Corona $1\frac{1}{2}$ inch wide and 1 inch deep expanded, chrome yellow shading to saffron yellow. Mouth expanded with reflexed serrated margins. Bulb of medium size. Free flowering. Flowering dates—1934, March 11 to April 4. 1935, from February 16. Raised and sent for trial by Mr. P. D. Williams.

***Narcissus 'Pentewan.'** H.C. March 5, 1935, as a variety for cutting from the open for market. An *Incomparabilis* variety (Division 2a). Vigorous. Stem 19 inches, thick and strong. Flowers well posed, slightly drooping. Perianth $3\frac{1}{2}$ inches diameter, segments overlapping half their length, chrome yellow. Corona $1\frac{1}{2}$ inch wide

* After trial at Gulval, Cornwall, where the plants were inspected on February 28, 1935.

and deep, expanding, sulphur yellow. Mouth slightly expanded with reflexed serrated margins. Bulb medium size. Very free flowering. Flowering dates—1934, March 5 to March 25. 1935, from February 9. Raised and sent for trial by Mr. P. D. Williams.

***Narcissus 'Pepper.'** A.M. March 5, 1935, as a variety for cutting from the open for market. A Barrii variety (Division 3a). Fairly vigorous. Stem $13\frac{1}{2}$ inches, medium thickness. Flowers very well posed. Perianth $2\frac{3}{4}$ inches diameter, segments separated and rather narrow, chrome yellow. Corona $\frac{3}{4}$ inch wide and deep, expanded, orange. Mouth expanded with serrated margins. Bulb medium to small. Very free flowering. Flowering dates—1934, March 5 to March 25. 1935, from February 4. Raised by Mr. J. C. Williams and sent for trial by Mr. A. M. Williams.

Narcissus 'Poldhu.' A.M. March 19, 1935, as a show flower. A self-coloured, pale greenish-white Leedsii variety with flowers of medium size ($3\frac{1}{2}$ inches diameter) borne on 14-inch stems. Segments smooth, inner rather pointed, and the neat cup about two-thirds as long as the segments. Shown by Mr. R. F. Calvert, Coverack.

***Narcissus 'St. Martin.'** H.C. March 5, 1935, as a variety for cutting from the open for market. An Incomparabilis variety (Division 2a). Vigorous. Stem 18 inches, medium thickness. Flowers well posed, slightly drooping. Perianth $2\frac{3}{4}$ inches diameter, segments overlap for one-third of their length, very wide, regular and blunt, primrose yellow. Corona $1\frac{1}{2}$ inch wide, $\frac{3}{4}$ inch deep, chrome yellow, edged sulphur yellow. Mouth expanded and frilled. Bulb medium size. Fairly free flowering. Flowering dates—1934, February 21 to March 23. 1935, from January 23. Raised and sent for trial by Mr. P. D. Williams.

***Narcissus 'Sulphur.'** A.M. March 5, 1935, as a variety for cutting from the open for market. An Incomparabilis variety (Division 2a). Vigorous. Stem $16\frac{1}{2}$ inches, thick and strong. Flower very well posed. Perianth $3\frac{3}{4}$ inches diameter, segments overlapping for one-third of their length, slightly incurving, chrome yellow. Trumpet $1\frac{1}{2}$ inch wide and deep, primrose yellow. Mouth expanded, frilled with serrated reflexed margins. Bulb medium to large. Free flowering. Flowering dates—1933, February 25 to March 22. 1934, March 4 to April 2. 1935, from February 4. Raised and sent for trial by Mr. P. D. Williams.

Narcissus 'Trenoon.' A.M. April 2, 1935, as a show flower, from Mr. J. L. Richardson. A yellow Incomparabilis variety (Division 2a) of great substance, well poised on a stout 20-inch stem. The buttercup-yellow perianth segments broad, overlapping and smooth; corona deep cadmium yellow and about three-quarters length of segments, reflexed at mouth. Raised by Mr. P. D. Williams.

***Narcissus 'Whiteley Gem.'** F.C.C. March 5, 1935, as a variety for cutting from the open for market. An orange-cupped Incomparabilis variety (Division 2a) raised by the Brodie of Brodie and sent for trial

* After trial at Gulval, Cornwall, where the plants were inspected on February 28, 1935.

by Mr. R. F. Calvert, Coverack, Cornwall. **A.M.** as a variety for cutting from the open for market on March 20, 1934. See vol. 95, p. 486.

Paeonia Cambessedesii. **A.M.** April 2, 1935. From G. P. Baker, Esq., Sevenoaks. A small herbaceous species from the Balearic Islands and Corsica, with attractive biternate foliage grey-green above and bronze-red beneath. The flowers are $3\frac{1}{2}$ inches across and have about ten firm, rounded, rose-pink petals and a central cluster of bright yellow stamens.

***Primula malacoides 'Sutton's Giant.'** **H.C.** February 8, 1935. From Messrs. Sutton, Reading. Plant vigorous, of erect habit; foliage medium green; flower spikes somewhat loosely arranged and freely produced; flowers single, $1\frac{1}{2}$ inch diameter, soft rose-pink; petals flat, margins deeply crenate; eye small, pale orange. A late-flowering variety.

Primula marginata. **A.M.** April 2, 1935. From Sir Oscar Warburg, Headley, Epsom. A reliable species for the rock garden and alpine house, with grey-green, coarsely toothed leaves attractively margined with yellow meal. The flowers are carried in loose umbels and are usually light lavender blue, but the colour is variable. A rather poor form is figured at t. 191 of the *Bot. Mag.*, published in 1792.

Rhododendron × 'Alix.' **A.M.** April 2, 1935, as a hardy flowering plant. From Lionel de Rothschild, Esq., Exbury, Hants. *R. barbatum* × *R. Hookeri*. Leaves crowded beneath the inflorescences; blades oblong-elliptic, rounded at base and apex, 13-18 cm. long, 5-6 cm. wide, dull green above, glaucous below; petiole stout, 2-3.5 cm. long. Inflorescence a compact globose truss of about 12 flowers; corolla bell-shaped, about 4 cm. long and 5.5 cm. across of a brilliant clear crimson; stamens and style very pale pink, shorter than the corolla tube.

Rhododendron Cubittii. **A.M.** March 19, 1935, from Lt.-Col. E. H. W. Bolitho, Heamoor, Penzance. A beautiful species of the Cilicalyx sub-series of the Maddenii series. Leaves with blades elliptic, 8-9 cm. long, 2.5-3 cm. wide, dark green above, glaucous below, scaly on both surfaces; petiole stout, up to 12 mm. long, grooved above, scaly and bristly. Inflorescence of 3-4 flowers; calyx small, rarely ciliate; corolla about 11 cm. across, white deeply flushed rose on the outside, especially on the tube, whitish within with a blotch of reddish-brown markings on the back of the tube within, becoming paler with age, slightly scaly and finely white pubescent (towards the base) outside; tube funnel-shaped about 5 cm. long; lobes about as long as the tube and 3.5 cm. wide, spreading and somewhat crisped on the margin; style about 5.5 cm. long, creamy, scaly and green at the base, exceeding the stamens whose white filaments are hairy in the lower two-fifths.

Rhododendron × euehelia. **A.M.** April 2 1935, as a rock garden plant. From Lord Aberconway, Bodnant, N. Wales. *R. repens* × ?.

* Award after trial at Wisley.

A low shrub about 10 inches high with numerous small oval leaves, 3-4 cm. long, 1.8-2.5 cm. broad, dark green above, yellowish-green below; petioles up to 1 cm. long. Inflorescence an open flat truss of about 6 flowers; pedicels up to 2.5 cm. long; calyx from small and scarcely 1 cm. long to large and cup shaped, 2.5 cm. long, and irregularly lobed, fleshy and deep crimson; corolla like that of *R. repens*, fleshy, bright deep crimson, about 4 cm. long and 5 cm. wide; stamens and style whitish.

Rhododendron taronense. F.C.C. April 2, 1935, as a greenhouse flowering shrub. From Lionel de Rothschild, Esq. A beautiful species of the series *Maddenii*, subseries *Cillicalyx* with loosely arranged elliptic leaves, acute at the apex, rounded to cuneate at the base, about 10 cm. long and 4 cm. broad, dark green above, glaucous and laxly scaly below; petioles stout, yellowish-green, about 2 cm. long. Inflorescence a well-formed, flat truss of 7 flowers; calyx obsolete and scaly; corolla white, flushed pink, darker outside especially along the middle line of the lobes, broad funnel-shaped, about 7 cm. long and 8.5 cm. wide, scaly outside, tube 4 cm. long, lobes 3.8 cm. long, 3.5 cm. wide; stamens creamy, pubescent in the lower part, about as long as the corolla tube; style exceeding the corolla, scaly at the base.

Rhododendron × valasplis. A.M. April 2, 1935, as a rock garden plant. From Lord Aberconway. *R. Valentinianum* × *R. leucaspis*. An erect, loosely branched, dwarf shrub, up to 30 cm. high; the branches spreading, long-hairy at first, becoming reddish-brown. Leaf blades oval, up to 4-5 cm. long and 2.3-3.5 cm. wide, shining green above, glaucous beneath, prominently ciliate at the margins with brownish hairs; petioles up to 1 cm. long, hairy like the branches. Inflorescence a loose truss of 4 flowers; calyx about 1.2 cm. long, pale green, divided almost to the base into 5 oblong obtuse lobes which are densely lepidote like the stout and somewhat reddish pedicels; corolla funnel-shaped with spreading lobes, about 3 cm. long and 5 cm. across pale creamy-yellow, scaly outside; stamens like the style, slightly yellower than the corolla, the filaments hairy towards the base; style scaly at the base.

Shortia uniflora grandiflora. F.C.C. April 2 1935. From Mr. W. J. Marchant, Staplehill, Wimborne. A small, shade-loving evergreen plant from Japan. It forms decorative tufts of rounded, sharply toothed, red-margined leaves; from among these arise very numerous scapes, each bearing a large, bell-shaped flower with five prettily fringed shell-pink petals. The plant exhibited was six years old, over a foot across and covered with flowers.

Tritonia undulata. A.M. April 2, 1935. From T. T. Barnard, Esq., Wareham. A very pretty South African plant suitable for the cool house. The small, deep rose flowers are carried on slender scapes 6 inches high, rising from the basal clusters of linear leaves, which are remarkable for their deeply and evenly undulate margins.

AWARDS TO DAHLIAS AT WISLEY, 1934.

THE trial of Dahlias at Wisley in 1934 contained 274 varieties, of which 44, selected for trial at Vincent Square, were new. The arrangement of the trial was on similar lines to that of former years, but the site was changed to the upper part of the garden in a more exposed area. They were examined from time to time by the Committee and on September 13, 1934, the Joint Dahlia Committee met to recommend awards.

The classification of the new varieties below is the same as that hitherto following.

*Class Ia. SHOW SINGLE DAHLIAS.**Golden Yellow.*

IRAQ (raised and sent by Messrs. Cheal of Crawley), A.M. September 13, 1934.—5 feet. Flowers 3 inches diameter; bright golden-yellow, tips bronze, zoned scarlet; on 6- to 14-inch stalks, erect and well above foliage.

*Class Ic. MIGNON.**White.*

ARABIS (Burrell).—1½ feet. Flowers 2½ to 3 inches diameter; white, base of petals pale lemon; on 6- to 10-inch stalks, erect and well above foliage.

Pink.

AMY (Treseder).—1½ feet. Flowers 3 to 3½ inches diameter; rosy-pink on yellow, tips shaded rose; on 6- to 12-inch stalks, erect and well above foliage.

*Class IIIc. DECORATIVE COLLERETTE DAHLIAS.**Crimson-maroon.*

TUNNEL ANVERSOIS (Nagels).—5 feet. Flowers 5 to 6 inches diameter; deep crimson-maroon, tips somewhat paler, collar white; on erect 6- to 10-inch stalks, well above foliage.

*Class IVb. MEDIUM PEONY-FLOWERED.**Scarlet.*

Gwilym White (raised and sent by Mr. A. J. Cobb of the University, Reading), H.C. September 13, 1934.—5 feet. Flowers 4½ to 5½ inches diameter; rich rosy crimson-scarlet; on erect 6- to 9-inch stalks, well above foliage.

*Class IVc. SMALL PEONY-FLOWERED.**Orange shades.*

RANGOON (Cobb).—4 feet. Flowers 3½ to 4 inches diameter; bright glowing orange; foliage tinged purplish-brown; stems somewhat drooping; flowers carried above foliage.

BRONZE WITCH (Cobb).—4½ feet. Flowers 3½ to 4 inches diameter; petals pointed, twisted; deep rich orange; on erect 9- to 15-inch stalks, well above foliage.

GEORGETTE (Cobb).—3½ feet. Flowers 3½ to 4 inches diameter; salmon-orange; on erect 6- to 9-inch stalks, well above foliage.

Cerise Shades.

Towneley Cheer (raised and sent by Mr. J. F. Barwise of Towneley, Burnley), A.M. September 13, 1934.—3½ feet. Flowers 3 to 4 inches diameter; bright rich rosy-cerise on yellow, base shaded orange; on erect 6- to 10-inch stalks, well above foliage.

Ridgmont (raised and sent by Mr. A. J. Cobb), A.M. September 13, 1934.—4 feet. Flowers 3½ to 4 inches diameter; florets somewhat quilled; bright glowing scarlet-cerise, tips rosy-purple; on erect 6- to 10-inch stalks, well above foliage.

Crimson.

MIRIAN (Burrell).—3½ feet. Flowers 3 to 3½ inches diameter; deep dull chestnut-crimson, tips pale rose; on erect 6- to 9-inch stalks, well above foliage.

*Class IVd. DWARF PÆONY-FLOWERED.**Scarlet.*

MICHAEL EXETER (Exeter).—2½ feet. Flowers 3½ inches diameter, bright crimson-scarlet, shading to magenta at tips, florets channelled; erect on 5- to 12-inch stalks, well above foliage.

*Class Vb. MEDIUM FORMAL DECORATIVE.**White.*

Mrs. David Ingamells (raised and sent by Messrs. Cheal), A.M. September 13, 1934.—Described JOURNAL R.H.S., 55, p. 130. (H.C. 1930.)

Yellow.

SCEPTRE (Cheal).—4½ feet. Flowers 4½ to 5½ inches diameter; bright lemon-yellow; on erect 8- to 10-inch stalks, well above foliage.

Pink on Yellow.

Trevor (raised and sent by Messrs. Cheal), A.M. September 13, 1934.—5½ feet. Flowers 5 to 5½ inches diameter, very free, bright rose-pink on yellow, base shaded orange; on erect 9- to 15-inch stalks, well above foliage.

Crimson.

Susie (raised and sent by Messrs. Burrell of Cambridge), H.C. September 13, 1934.—5 feet. Flowers 4 to 5 inches diameter, florets channelled; deep rich crimson; on erect 9- to 15-inch stalks, well above foliage.

*Class Vc. SMALL FORMAL DECORATIVE.**White.*

BEECHFIELD WHITE (Elsom).—4 feet. Flowers 4 inches diameter; white; on erect 6- to 11-inch stalks, well above foliage.

Yellow.

Golden Nugget (raised and sent by Mr. J. F. Barwise), A.M. September 13, 1934.—3½ feet. Flowers 3½ to 4 inches diameter; golden-yellow, faintly shaded bronze; free, erect, on 6- to 9-inch stalks, well above foliage.

Orange-apricot.

Gladsome (raised and sent by Mr. Burrell), **H.C.** September 13, 1934.—Described **JOURNAL R.H.S.**, 59, p. 158.

Apricot.

CONSTANCE (Elsom).—3½ feet. Flowers 3 to 4 inches diameter; creamy-apricot shaded pale rose; on erect 6- to 12-inch stalks, well above foliage.

Rosy Red.

RUBRIC (Burrell).—4½ feet. Flowers 3 to 4 inches diameter; very free flowering; bright pale rosy red, fading; on erect 6- to 10-inch stalks, well above foliage.

Class Vd. DWARF FORMAL DECORATIVE.

Scarlet.

Torquay Gem (raised and sent by Messrs. W. Treseder of Cardiff), **A.M.** September 13, 1934.—2½ feet. Foliage purplish-brown; flowers 3 to 3½ inches diameter; deep rich glowing scarlet; on erect 6- to 10-inch stalks, well above foliage. (**Gold Medal N.D.S.** 1934.)

Class VIa. LARGE INFORMAL DECORATIVE.

White.

ICEBERG (de Mole & Kisch).—5 feet, very vigorous. Flowers 8 to 10 inches diameter; white; on drooping 8- to 15-inch stalks, hidden by foliage.

Orange-apricot.

Nagels Glory (raised and sent by Messrs. Nagels of Belgium), **A.M.** September 13, 1934.—4½ feet. Flowers 7 to 9 inches diameter; bright orange-apricot on yellow; free, erect, on 9- to 14-inch stalks, above foliage.

Salmon-apricot.

Isabel McElvey (raised by the Bime Boston Dahlia Farm of California, U.S.A., and sent by Mr. J. B. Riding of Chingford), **H.C.** September 13, 1934.—5 feet. Flowers 7 to 9 inches diameter, bright apricot, broadly banded salmon; free, erect, on 9- to 12-inch stalks, well above foliage.

Pink.

Pink Dally Mail (raised and sent by Messrs. Sandford of Barton Mills, Mildenhall), **A.M.** September 13, 1934.—4½ feet. Flowers 9 to 11 inches diameter; pale rose-pink; free, erect, on 9- to 12-inch stalks, above foliage.

Scarlet.

Lowfield Scarlet (raised and sent by Messrs. Cheal), **A.M.** September 13, 1934.—Described **JOURNAL R.H.S.**, 58, p. 195. (**H.C.** 1932.)

HERCULES (de Mole & Kisch).—6 feet. Flowers 8 to 11 inches diameter; rich crimson-scarlet, on erect 6- to 14-inch stalks, at first hidden by foliage, afterwards above.

Class VIb. MEDIUM INFORMAL DECORATIVE.

Creamy Pink.

Northern Beauty (raised and sent by Messrs. Dickson & Robinson of Manchester), **A.M.** September 13, 1934.—Described **JOURNAL R.H.S.**, 58, p. 195. (**H.C.** 1933.)

Rose.

Maypole (raised and sent by Mr. J. T. West of Brentwood), **H.C.** September 13, 1934.—Described **JOURNAL R.H.S.**, 59, p. 161.

Pink on Yellow.

Bridesmaid (raised and sent by Mr. J. T. West), **A.M.** September 13, 1934.—Described **JOURNAL R.H.S.**, 59, p. 161.

Scarlet.

General Scarlett (raised and sent by Mr. J. F. Barwise), **A.M.** September 13, 1934.—4 feet. Flowers $4\frac{1}{2}$ to 6 inches diameter; bright glowing scarlet; full, erect, on 6- to 10-inch stalks, above foliage.

COVENT GARDEN (West).—6 feet. Flowers 5 to 6 inches diameter; deep rich scarlet; erect, on 8- to 12-inch stalks, well above foliage.

*Class VIc. SMALL INFORMAL DECORATIVE.**Orange.*

Friars Craig (raised and sent by Mr. J. T. West), **A.M.** September 13, 1934.—4 feet. Flowers $3\frac{1}{2}$ to $4\frac{1}{2}$ inches diameter, bright glowing orange; free, erect, on 6- to 9-inch stalks, well above foliage.

Cream Pink.

Ethel Windibank (raised and sent by Mr. C. A. Hay of Hindhead), **H.C.** September 13, 1934.—4 feet. Flowers $3\frac{1}{2}$ inches diameter; soft creamy rose-pink, base of petals shaded pale yellow; on erect 6- to 10-inch stalks, well above foliage.

Carminé Shades.

Derwentwater (raised and sent by Mr. J. T. West), **H.C.** September 13, 1934.—Described **JOURNAL R.H.S.**, 59, p. 162.

Margaretta V. Drury (raised and sent by Mr. J. Burrell), **H.C.** September 13, 1934.—Described **JOURNAL R.H.S.**, 59, p. 162.

Rose on Yellow.

Calder (raised and sent by Mr. J. F. Barwise), **H.C.** September 13, 1934.— $5\frac{1}{2}$ feet. Flowers 4 to $4\frac{1}{2}$ inches diameter; bright rose on yellow; on erect 9- to 14-inch stalks, well above foliage.

Rose.

ETHEL HARRILD (West).— $3\frac{1}{2}$ feet. Flowers $3\frac{1}{2}$ inches diameter, bright pale rose; on erect 6- to 9-inch stalks, well above foliage.

Scarlet.

Tots (raised and sent by Mr. J. T. West), **H.C.** September 13, 1934.—3 feet. Flowers 3 to $3\frac{1}{2}$ inches diameter; petals somewhat rolled, incurved, pointed; brilliant scarlet; on erect 4- to 8-inch stalks, well above foliage.

Naiomi (raised and sent by Mr. Burrell), **A.M.** September 13, 1934.—Described **JOURNAL R.H.S.**, 59, p. 162.

Crimson.

MATTIE (Burrell).—3½ feet. Flowers 3½ inches diameter; florets flat, pointed; deep velvety rosy-crimson; on erect 6- to 10-inch stalks, well above foliage.

Class VI. DWARF INFORMAL DECORATIVE.*Orange-scarlet.*

Brentwood Scarlet (raised and sent by Mr. J. T. West), A.M. September 13, 1934.—Described JOURNAL R.H.S., 59, p. 162. (H.C. 1933.)

Scarlet.

Owlet (raised and sent by Mr. J. T. West), A.M. September 13, 1934.—Described JOURNAL R.H.S., 59, p. 163.

Class VIII. POMPON DAHLIAS.*Yellow.*

HONEY (Carter Page).—3 feet. Flowers 2 to 2½ inches diameter; bright lemon-yellow, tips of florets bronze; free, erect, on 6- to 9-inch stalks, well above foliage.

Scarlet.

Gertrude (raised by Mr. Carl Salbach and sent by Messrs. Gibson & Amos of Cranleigh), A.M. September 13, 1934.—Described JOURNAL R.H.S., 59, p. 163. (H.C. 1933.)

Class IX. CACTUS DAHLIAS.*Orange.*

Miss Belgium (raised and sent by Messrs. Nagels), A.M. September 13, 1934.—5½ feet. Flowers 6 inches diameter; bright rich orange shaded scarlet; very free, erect, on 6- to 12-inch stalks, well above foliage.

Crimson.

SHINTENCHII (Riding).—6 feet. Flowers 6 inches diameter; dull crimson, stems erect, neck weak, stalks 6 to 10 inches, above foliage.

Class Xa. LARGE-FLOWERED SEMI-CACTUS.*Orange.*

SOUTHERN BELLE (de Mole & Kisch).—6 feet. Flowers 7 to 9 inches diameter; rich glowing orange; on drooping 6- to 10-inch stalks, at first hidden by foliage, afterwards above.

Pink.

Dawn O' Day (raised and sent by Mr. J. T. West), A.M. September 13, 1934.—6 feet. Flowers 5 to 6½ inches diameter; pale rose-pink on cream narrowly edged scarlet; on erect 6- to 8-inch stalks, well above foliage.

Scarlet.

Leiden's Elegance (raised and sent by Messrs. J. G. Ballego of Leiden, Holland), A.M. September 13, 1934.—6 feet. Flowers 5½ to 6½ inches diameter; rich crimson-scarlet; on erect 6- to 14-inch stalks, well above foliage.

*Class Xb. SMALL-FLOWERED SEMI-CACTUS.**Pink and Yellow Shades.*

SONNY (West).—4 feet. Flowers $3\frac{1}{2}$ to 4 inches diameter; bright yellow shaded pale pink; on erect 6- to 10-inch stalks, well above foliage.

BABY PRINCESS (West).—4 feet. Flowers $3\frac{1}{2}$ to $4\frac{1}{2}$ inches diameter; bright rose-pink shading to orange at disc; on erect 6- to 12-inch stalks, well above foliage.

WINNIE CORNHILL (West).—4 feet. Flowers $3\frac{1}{2}$ to 4 inches diameter; bright apricot-salmon on yellow, base shaded orange; on erect 6- to 9-inch stalks, well above foliage.

Marjorie Emberson (raised and sent by Mr. J. T. West), A.M. September 13, 1934.— $3\frac{1}{2}$ feet. Flowers $3\frac{1}{2}$ inches diameter; bright salmon-rose on yellow, base of florets shaded orange; very free, on erect 6- to 9-inch stalks, well above foliage.

Rose.

LITTLE LOVE (West).—3 feet. Flowers $3\frac{1}{2}$ to 4 inches diameter; bright rose, base of florets pale yellow; on erect 4- to 9-inch stalks, well above foliage.

*Class XI. STAR DAHLIAS.**Orange.*

WORTHING STAR (Cheal).—3 feet. Flowers 3 to $3\frac{1}{2}$ inches diameter; deep rich orange; free, erect, on 6- to 9-inch stalks, well above foliage.

FRUIT NOTES.

Pears in 1934.—The unusually warm summer of 1934 upset the customary ripening season of Pears, especially the later ones, and an interesting discussion at a meeting of the Fruit Committee suggested that some of these facts were worthy of record. Several members have been good enough to send notes of their experiences, which are given in full.

Mr. CHAS. J. NIX, V.M.H., of Tilgate, Crawley, Sussex, reported by
Mr. NEAL :

The variation of late Pears this season has been most marked in the ripening and flavour. The colouring has been all that one could wish, most of the late sorts ripening quite three weeks earlier than usual.

'*Winter Nelis*,' one of best-flavoured Pears, with me was not so good in flavour as in most seasons. I put it down to maturing too early and they were soon over.

'*Glou Morceau*' behaved quite differently. It ripened at the right time, of good colour and flavour, and lasted well into February. This delicious Pear so often disappoints one. In past seasons it has not been very satisfactory in colour or flavour. I think our cold clay soil accounts for a great deal of the uncertainty of this valuable Christmas Pear.

'*Josephine de Malines*' this season has not been at its best. Like many others it ripened most of its fruits three weeks too early; flesh pale, not good flavour. The later-ripened fruits were much better, flesh more its natural colour, and of better flavour, skin good colour. Season rather short.

'*Duchesse de Bordeaux*.'—Varied very much in ripening and flavour. Some fruits were quite first class, others hard and gritty, the colouring good; on the whole rather disappointing, considering it had always before ripened so well, and the flavour has been excellent.

Why Pears have varied so here this year is rather puzzling, as the trees have not wanted for water all through the drought. The heat, which was rather excessive at times, may account for the early maturing. The two most reliable Pears I have here are '*Emile d'Heyst*' and '*Doyenné du Comice*.' The first named has a very hardy constitution, is a good cropper, and quite good in flavour. The latter needs no commendation. These two varieties have proved their worth for many years here on this heavy clay soil.

Mr. F. BOSTOCK, Pitsford House, Northampton :

My soil is dry on the whole, being an ironstone kail, and we can do with plenty of rain.

'*Doyenné du Comice*.'—We had a fine crop, and on the whole the quality and the flavour were good, but not up to tip-top. This wonderful Pear with me always seems to be able to crop well no matter what the season is. It seems to have every good quality, and I have no other Pear that comes anywhere near it.

'*Beurré Hardy*.'—Good, but not up to the best flavour.

'*Louise Bonne of Jersey*.'—First class.

'*Winter Nelis*.'—Good crop and good quality and flavour.

'*Comte de Lamy*.'—First class.

'*Josephine de Malines*.'—We had large crops, but this Pear was distinctly a failure with us as to flavour. It also ripened before its usual season. A great disappointment with us.

'*Thompson's*.'—Not quite up to quality, but a good crop.

General Remarks.—One would have thought with such a wonderful lot of sun that Pears would have been exceptionally good. I am convinced that they would have been had it not been for the great want of rain just after the seeds had formed and when the fruit was swelling. Pears also undoubtedly benefit a great deal by rains when they are reaching their full size. Unfortunately these were also lacking.

Mr. F. STREETER, Petworth Park Gardens, 1934 :

Growth of all Pear trees was exceptionally good and clean. Trees are mostly grown on walls 15 to 20 feet high, wired and in prepared borders 2 feet deep, 4 feet wide. The soil is lime-free medium loam ; to get the correct rooting medium heavy loam is added from another part of the estate, wood ash, coarse bone meal and plenty of mortar rubble. Water is given as required, generally twice a week, and, when the fruit is growing, plenty of good manure water. All ground is covered with a farmyard mulch after fruit has set. Number of trees 500, mostly cordons. Growth is regulated by early pinching rather than by hard pruning. As Pears have to be produced and supplied to the house in the best possible condition, no time or attention is spared to provide the finest specimens. A very large number of varieties are grown, but those found worthless are being eliminated, a few each season, and their places taken by young proved varieties.

'*Williams' Bon Chrétien*.'—Fruit was richly flavoured, of good colour, but the heat caused it to ripen a little too quickly. The season was exactly twenty-eight days.

'*Clapp's Favourite*.'—This variety is not good enough for first-class work. The fruit was large, a lovely yellow with red streaks of large size. Could only be used in the kitchen. Season, fourteen days.

'*Dr. Jules Guyot*.'—Fruit rather large, but uneven, pale yellow. Came away from the tree before its time, and inside the flesh were black spots which quickly spread over the whole fruit. Could not send in for any purpose ; failure.

'*Fondante d'Automne*.'—This is one of our very old varieties, growing on a south-west wall ; fan-shaped, extra large tree. Quality

very good from young wood at extremities of branches, on the old spurs fruit spotted, colour dark brown and with russet spots. Young wood fruits lasted thirty-six days, old spur fruits used in kitchen.

'*Marguerite Marillat*.'—Fruit too large and could only be used for dinner parties, a beautiful colour, light yellow and scarlet. This variety also suffered from the spots inside the fruit, and in several cases the sun had scorched the skin, which immediately went hard, remaining so till the season was over. Quality not right for first-class dessert.

'*Louise Bonne of Jersey*.'—This variety was excellent in every way, withstood feeding right up to time of picking. We were gathering on twenty-one separate dates. The season lasted one month. One of our best Pears last season both on walls and in open.

'*Marie Louise*.'—Another good quality fruit. We have two distinct forms—one pale green changing to yellow and the other quite brown with russet spots over the face—and the fruit appears rough. This is one of our surest croppers in all seasons. Fruit in fair condition for one month.

'*Pitmaston Duchess*.'—Very large, perfect shape, excellent cropper. I have formed a good opinion of this variety, despite its size. The flavour is quite good, and when dishing up for large parties it forms one of the most noticeable dishes. Lasted in season five weeks.

'*Doyenné du Comice*.'—This is undoubtedly our finest Pear, but with us it suffered from the same trouble as several other varieties—viz. the internal spotting. Another year if the sun proves so strong, I shall try to shade with tiffany during the hottest part of the day. This trouble was very prevalent in both France and Belgium. We gathered 1000 specimens. They lasted till Christmas, but had a nasty habit of going wrong in twenty-four hours. A lovely Pear for using as a fruit course; requires very careful watching for feeding and gathering. Tits most troublesome, also bees. We use cellaphane bags.

'*Seckel*.'—This wonderful little Pear is not grown in anything like the quantity its qualities merit. Very heavy crop, and used for tea on silver dishes proved most acceptable, very few being left each day. It is very small, sweet and a dark red. Season fourteen days, went off very quickly.

'*Thompson's*.'—The quality first class, white flesh and colour pale yellow. Came in just before '*Doyenné du Comice*,' and lasted for three weeks.

'*Josephine de Malines*.'—This variety came into season toward the end of December, and is still being used, end of January. On young trees the fruit was of good size and excellent quality; requires to hang as long as possible on the trees, even though the glass falls to freezing; a little netting hanging over the trees will give protection sufficient to keep the fruit from frost.

'*Olivier de Serres*.'—Another late Pear which did exceedingly well, although it came before its usual time. Fruit of first-rate quality.

Very flat and russety, requires to be placed in a warm temperature before sending to the table. Season, four weeks to the present.

'*Glou Morceau*.'—This is the first year I have had good fruit of this variety from outside. It requires an orchard house to bring out its fine qualities, when it is superb. Fruit green, paling to light yellow. Requires plenty of feed when making up and is one of the very last to pick, but requires very close watching, as the fruits will nearly all fall to the ground in one night when ready. Our fruit are not equal to those grown inside, the flavour being rather flat, or insipid, and we are still using.

Mr. J. WILSON, The Gardens, Trent Park, New Barnet, Herts :

I cannot claim that we have an extensive collection of Pears or that they do exceptionally well, but during my eight seasons here 'Doyenné du Comice' has always cropped and done remarkably well. It was noticed during the past two seasons that, although this variety cropped and finished well, it did not possess the flavour that has been produced in years considered less favourable Pear seasons; that the earlier varieties like 'Williams' Bon Chrétien' and 'Louise Bonne of Jersey' were affected in a similar way, whereas later varieties like 'Passe Crassanne' and 'Olivier de Serres' were of exceptional flavour.

I have formed the opinion from my observations that hot seasons favour high flavour in late varieties of Pears, whereas to the early and mid-season varieties it seems to be adverse.

GARDEN NOTE.

Stapelia nobilis.—Mr. HALES'S note on *Stapelia nobilis* (p. 131) suggests to me that an account of our experience with the species may interest the readers of the JOURNAL. We grow it under distinctly warmer and moister conditions than other succulents. It flowered freely last year from July to November. The flowers are mostly at least double the size recorded by Mr. HALES, the corolla usually measuring 11 or 12 inches from point to point when outstretched and often more, occasional flowers reaching a span of 16 inches. A large plant may bear several such flowers at the same time and makes a handsome show, though in a confined space the carrion-like odour may be at times overpowering. One plant last July had eight flowers open at the same time, ranging from 11 to 14 inches across.

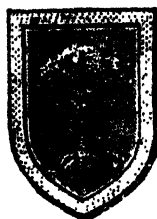
I collected the specimen, from which all our plants and many we have distributed were propagated, in July 1920, from Cataract Island, on the brink of the Victoria Falls, and often under the influence of spray. The plant was growing in humous soil at the foot of a tree; it was not in flower. The habitat struck me as unusual for a succulent and in strong contrast to the dry Karroo and the northern slopes of Table Mountain, where other species of *Stapelia* and allied genera occur. I took a portion of the plant to Cape Town, where it rooted readily in the greenhouse of the Botanical Department of the University and began to flower after a couple of years.

I brought a piece to Bangor with me in 1923, but had difficulty with it at first, as it proved highly susceptible to the attack of larvæ of a Mycetophilid fly (Fungus gnat) with which the old greenhouse had become infested. They caused blackening at the base of cuttings and cessation of root development and growth. Water barriers preventing access of the apterous female, silver sand for striking, and soil sterilization overcame the difficulty and the plants have since flourished exceedingly, especially after our transfer to the new laboratories at the Memorial Buildings, where it has been possible to provide more suitable conditions for their growth.

The plant was identified at Kew in 1927 as *Stapelia nobilis* by Mr. N. E. BROWN. Other records of the species are from farther south, from the Bulawayo district in Southern Rhodesia, the Transvaal, and (probably) Natal.—D. Thoday, Department of Botany, Bangor University College.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part 6

June 1935

To His Most Excellent Majesty George V.

May it please Your Majesty—

We Your Majesty's loyal and dutiful servants the Council of the Royal Horticultural Society desire on behalf of ourselves and Fellows herewith and now to convey our sincere felicitations on this the memorable occasion of the Twenty-fifth Anniversary of Your Majesty's Accession to the Throne.

We are sensibly grateful for Your Majesty's constant and kindly interest in our Society expressed not only by a patronage of twenty-five years but by Your Majesty's visits from time to time to the Society's Shows, thereby creating an enduring encouragement for the development of Horticulture in all its branches for which this Society stands.



Signed on behalf of the Council and
Fellows

ABERCONWAY,
President.

SPECIES OF TULIPA FOR THE GARDEN.

By Sir A. D. HALL, F.R.S.

[Read April 30, 1935 ; E. A. BOWLES, Esq., F.L.S., V.M.H., in the Chair.]

THE species of Tulips have received too little attention in furnishing our gardens.

They are less robust and more particular in their requirements than the Darwins and Cottage Tulips ; they are dear for those who only desire a splash of colour in their garden, but many of them have a rare and special beauty that repays a little personal trouble.

The natural home of the genus is the mountainous and steppe country that extends from Greece to the Altai Mountains ; Kashmir and Palestine mark the boundaries in other directions, and one or two species, truly wild or colonists, extend along the Mediterranean and cross to the Atlas. It is a region characterized by a hot and almost rainless summer and intense winter cold, followed by a short spell of growing weather during which the Tulip reaches its flowering stage before it is dried up and rests as a bulb into the following season.

Our difficulties in growing Tulips all arise because our climate lacks these definite alternations of season. The bulbs are not always properly ripened off, and are prematurely started into growth in our mild moist winters, often to be damaged by later visitations of frost and rain.

Hence we must adapt our treatment to reproduce the natural conditions as far as we can. The smaller species can find a place in the rock garden ; for the larger ones a special bed should be chosen, not the rough and tumble of a mixed herbaceous border. It must be sheltered from wind, yet in full sun and freely exposed to the airs. The next thing to ensure is absolute drainage : waterlogging in winter is fatal ; the ideal is 2 feet deep of worked soil that, if not naturally light, has had plenty of coarse sand and grit worked into it. The top spit may have leaf-mould or peat moss incorporated with it, but never fresh manure ; old potting soil is useful. The Tulip is not fastidious about soil ; if deficient in lime a little powdered chalk or old mortar should be added ; basic slag (2 oz. to the square yard) is valuable, and on very sandy soils $\frac{1}{2}$ oz. to the square yard of sulphate of potash, but no nitrogenous manure.

Two methods of cultivation may be followed—annual lifting of the bulbs where the soil is heavy or the winter rainfall high, or permanent planting in drier localities. Annual lifting is perhaps safer but rarely gives such fine results as the other plan can produce. Lift when the foliage is fully withered but not decayed away ; do not expose the bulbs to the sun, but let them dry under cover before clearing off the dead tissue. They will be all the better for being kept in a warm

place until near the end of June, then they should be stored in a cool dry place until replanted in early October. Should the outer coat of the bulbs, the tunic, be very thick and hard, it should be shelled off in part at least before planting, or the roots and sometimes even the growing point may not be able to get free.

If the bulbs are to remain undisturbed, the important thing is to plant deep, 6 inches for the small, 9 inches, or even more in light soils, for the large bulbs. They thus appear a little later and may escape dangerous weather, and they are a little further from the attentions of slugs and mice. The one disease that commonly troubles Tulips is "fire" (*Botrytis*), first seen as withered spots and patches on the foliage, but which may travel down and destroy the bulbs. Usually it enters at some spot damaged by frost, especially in wet weather when the foliage is gorged with water. There is no remedy, but some control can be effected by cutting out any patches of diseased tissue as they are seen.

Like the garden Tulip the species will "break," and then their beauty is greatly impaired. But as they mostly complete their growth before the aphid carrying virus is about, breaking is not common; still it is well to keep them away from other stocks containing broken Tulips.

Most of the Tulip species bloom very early in the year, *Tulipa Kaufmanniana*, for example, in early March or even in February; consequently they do run some risk of weather damage in this fickle climate of ours. The grower must either accept the risk and be prepared to see his bloom rendered rather miserable in certain years, or he can erect a framework and cover the bed with lights, preferably the Dutch lights with single sheets of glass, raised about 3 feet from the ground. The lights need only be put on when the foliage is well above ground, but if the grower can tolerate their unsightliness they should be left on until the autumn, for that ensures the thorough ripening the Tulip likes. The following species that can be trusted to answer under our conditions are recommended as obtainable at not too high a price. There are many other desirable species that are either too rare or too weak in constitution for ordinary garden purposes. That the species are not cheaper is mainly due to the limited demand, for they could be raised in quantity from seed if there were sufficient call for them.

The genus *Tulipa* is divided into two main groups. In the one, the *Eriostemon*es, the filaments are clothed with short hairs near the base, as also the edges of the inner perianth segments or petals near their base; the flowers in their early stage show a special pear-shaped profile; and the leaves are mostly narrow and folded to form a channel along the midrib. The three filaments associated with the inner perianth segments are longer than the other three. In the *Leiotemon*es, without hairs on the filaments, the buds are oval, and, except in one group, the leaves are broad and often glaucous.

The best known of the *Eriostemon*es is *T. sylvestris*, which is to be

found in several English localities as an escape from cultivation ; indeed, it is doubtfully indigenous even in Southern Europe, where it is a common weed of the vineyards. It is a Tulip of slender growth about 8-10 inches high, often carrying two flowers with nodding heads, greenish on the backs of the petals, clear bright yellow within when the flowers open in the sun, and deliciously scented. It grows freely enough, but rarely flowers in its English habitats ; in gardens it needs a dry, hot situation to ensure bloom. *T. sylvestris* is known in one or two variant forms ; that from Tabriz has a rather tighter habit of growth and flowers more freely. *T. sylvestris* is a tetraploid species which is presumably derived from a very similar but smaller species, *T. australis*, which is wild in the Apennines, the South of France, Spain, and again on the other side of the Mediterranean in the Atlas. (*T. Celsiana* and *T. fragrans* are among the numerous synonyms.) Its flowers may be tinged with red on the backs of the petals, and it is often preferred to *sylvestris* because it flowers more freely.

Among varieties of *T. australis* is the small late-flowering yellow Tulip of unknown origin known as *T. persica*, first-rate for the rock garden, opening as it does in the sunshine to flat fragrant stars ; and the pale yellow or cream-coloured *T. primulina* from Algeria, which grows very freely in warm situations.

In Greece two closely related Tulips occur, bronze or smoky buff in colour instead of yellow—*T. Orphanidea* and *T. Hageri* (fig. 71), hardly distinguishable except that the flower of *Orphanidea* is long and oval, while that of *Hageri* makes a square-based cup rather like a Fritillary. They are charming but not exciting flowers, 6-8 inches high, with two or three flowers springing from a common base ; they show a number of variations, among which those known as *Hageri nitens* are somewhat more brilliant in colour.

Further East, from Asia Minor and Persia, comes another group of these Tulips with hairy filaments, not more than 4 or 5 inches high, and again often two-flowered. In colour they range from white through mauve or pink to deep crimson or purple, with bases of all shades of blue or yellow. At various times geographical segregates have been described as distinct species—*pulchella*, *violacea*, and many other names—but since the material which VAN TUBERGEN's collector sent back from one locality in Persia includes all these different forms, they should be gathered into a single species to which the earliest name, Dean HERBERT's *T. humilis*, should be attached. Latterly they have often been exhibited at the spring shows of the Royal Horticultural Society as *violacea-pulchella* hybrids, but there is no record of hybridism : they are merely natural variants of one highly polymorphic species, more or less distinct segregates of which have established themselves in various localities of its wide range of country and may be regarded as geographical sub-species. All the members of the group are worthy of a choice place in the rock garden, and make delightful pots for the Alpine House.

A derivative from this group, but much larger, since the stem will

grow to a foot in height and carry two or three flowers a couple of inches in diameter, is the Cretan Tulip, *T. saxatilis*. It is a very distinct Tulip with broad leaves of a dark shining green that appear before the New Year and are indifferent to frost. The flowers are exquisite—soft rosy mauve surrounding a base of pure yellow, but, as PARKINSON noted three hundred years ago, they all too rarely appear in this country. This Tulip wants the hottest, driest place in the garden, there to starve itself by its habit of multiplying by stolons which may extend half a yard from the parent bulb.

T. biflora and its tetraploid *T. turkestanica* are tiny white Tulips hardly worth cultivation, but the recently introduced *T. polychroma* from Persia (fig. 72), ivory faintly flushed with green and purple, merits a choice place in the rock garden. Lastly, among the Eriostemones a place in every rock garden should be found for the dwarf Tulip catalogued as *T. dasystemon* but renamed *T. tarda* by the late Dr. STAPP (fig. 73). It does not grow more than 3 or 4 inches high, but it gives a cluster of starry white flowers with a bright yellow base, about 1½ inch in diameter. It flowers among the latest and will increase rapidly into a thickset carpet, most cheerful in the sun.

Among the Leiestemones there are two small detached groups. One includes the brilliant *T. linifolia*, crimson-scarlet with a small blotch of deep blue, growing as a rule about 6 inches high, though taller and some almost sessile forms occur. The pale yellow *T. Batalinii* is only a colour variant, and crosses have been made between the two that exhibit all intermediate shades of apricot and 'pale scarlet. These are among the best Tulips for the rock garden, and in a well-drained, warm and sheltered place will grow into vigorous clumps. *T. Maximowiczii* is only a form of *linifolia*, but the rare and beautiful *T. Wilsoniana* (more properly *T. montana*) from Persia is distinct. The other clearly differentiated group comes from the hill country of Persia, Afghanistan and northern India to Kashmir; it includes the well-known Lady Tulip, *T. Clusiana*, and the two colour forms of a single species that have been named *T. stellata* and *T. chrysantha*. The Lady Tulip may grow to a foot or more in height, slender and upright, with a white flower 1½ inch long when unopened, heavily stained with crimson on the backs of the outer petals. When it is open a deep purple blotch is revealed with filaments and anthers of the same colour. *T. Clusiana* is becoming common since it is naturalized in the South of France, and comes on to the market as a cut flower. It will not always make itself at home and flower in English gardens, but it should be persevered with, for it can grow into one of the loveliest of groups when established. It also has the stoloniferous habit and will wander. *T. stellata* is closely related, not so tall and with less colour on the backs of the petals; when open a pale yellow base is seen instead of the purple eye of *T. Clusiana*. Among the stocks in cultivation is a taller form with an unworthy trick of throwing double flowers. *T. chrysantha* merges into *T. stellata*, but in the best forms the ground colour of the flower is a bright yellow, heavily stained with

crimson on the backs of the outer petals. These species are better adapted to the rock garden than the open bed, but can be established to form healthy clumps.

Not unlike *T. chrysantha* with its yellow flowers red on the backs, but with broader leaves and a less decided colouring, is the Central Asiatic *T. Kolpakowskiana*, which, however, lacks the grace of *T. chrysantha*. Again unrelated but worthy of a place in any garden is the Central Asiatic *T. Sprengeri*, a tallish Tulip with a loose long-petalled flower, orange-scarlet with an olive base, the latest of all Tulips to flower. *T. Sprengeri* will flourish among light shrubs like Azaleas and will seed itself freely.

We now come to the large-flowered species which can compete in size with and even excel the garden Tulips; these species are hardly for the rock garden, but should be given a bed of their own.

To begin with comes the group with bulbs thickly coated with a felt of wool, the scarlet Tulips of the Near East, which are best grouped under the collective name of *T. oculus-solis*. The typical *T. oculus-solis*, PARKINSON'S "red Tulip of Bologna," which may any year be bought in great bunches in the markets of Florence or Bologna though it is an Asiatic Tulip only naturalized along the Mediterranean, is a bad doer in English gardens and should be let alone. Often confused with it in Floras is *T. praecox*, a tall, strong-growing Tulip naturalized in southern Europe, which carries a light brick-scarlet flower marked inside with a large black blotch margined with yellow. *T. praecox* can always be distinguished by the fact that the inner segments of the perianth are shorter than the outer, rounded at the top, and carry a well-defined narrow light-coloured stripe down the middle. *T. praecox* is a good doer, flowers early, and is a handsome species when well grown and open in full sunshine. But it is not well proportioned; the flower is too small for the ramrod stem, the petals are dull in colour outside and given to withering at the tops. There are many better forms in this *oculus-solis* group, such as the broad-leaved form distributed by Lady ROCKLEY from material collected by her son in Iraq and described in Bot. Mag., t. 9356, as *T. Stapfii*, or a Syrian form *T. Boissieri*, or the claret-coloured form from Cyprus described as *T. cypria*.

In this group there is a great range of variation in habit of growth, colour, shape of the blotch, absence or presence of a yellow margin, and the variations are as great between individuals in any one locality as between those from different localities which have been separated as distinct species. In Palestine, Syria, Iraq or Persia these are the common Tulips, generally called *T. montana*, a name which has been transferred to this group in error. Bulbs are frequently brought home but rarely acclimatize successfully, because for years they start into growth so early that they get badly damaged in the late spring frosts. Seedlings raised from them would probably be more hardy. The one Tulip of this group that merits every possible attention is *T. lanata* from Persia and further East, which is also known from

Kashmir, where as an introduction it is grown on the roofs of temples. It is a tall upright Tulip, up to 3 feet in height, and carries one of the largest of all flowers of the genus, brilliant scarlet with a bold black blotch margined with yellow. The petals are pointed and reflex as the flower opens; the colour outside is rather lighter than within, but brilliant as is the colour the inner surface of the petals does not shine as do some of the other Central Asiatic Tulips. *T. lanata* grows well and increases freely by stolons; it must be grown in a sheltered spot or tied to a stake before the bud expands, for when open the stem carries far too much sail to stand up to any sort of a wind.

After this woolly-coated group comes another natural group of Central Asiatic Tulips with large flowers and bulbs that agree with the bulbs of our garden Tulips in possessing a few silky hairs on the inside of the tunic.

Presumably the garden Tulip originated from a species within this group, now lost because it has become merged in and confused with its variable descendants. The group includes four species of the highest value, each in their way more brilliant than any of the garden varieties.

T. Kaufmanniana, sometimes called the Water-Lily Tulip because of its colouring and shape when wide open, is the earliest of all to flower in early March or late February. It is definitely dwarf for the size of the flower, perhaps 8 inches high, when the flower is 5 inches across. In the type flower the ground colour is white with a clear yellow base at the top of which there are generally a few crimson markings forming an imperfect crescent. The backs of the outer petals are more or less stained with red. But it is a highly variable species, and from collected material and seedlings an immense range of varieties has been selected, with ground colours ranging from white through pure yellow to soft crimson and bright scarlet. The shape of the flower, the habit of growth, and the time of flowering all vary—and good examples have been propagated as clones and given names—*ryensis*, 'Gaiety,' 'Brilliant,' *coccinea*, etc. But anyone with a little patience who will raise seedlings from a few of the good forms can possess himself of the whole gamut of variations.

T. Kaufmanniana is one of the most grateful of all Tulips to grow; it is robust, increases well, and is not pernickety about soil. A bed of it is a glory, for it opens freely to the weak March sunshine. Of course, blooming so early it is liable to damage from weather, hence the value of a covering of lights. If the bulbs are to be lifted annually, it is often necessary to dig for them even a foot below the depth at which they were planted.

Closely related to *T. Kaufmanniana* but flowering a fortnight or three weeks later is *T. Greigii*, an upright Tulip growing to 18 inches or so, possessing foliage marked with purple stripes which fade somewhat as the plant ages. As the flower opens the petals reflex and roll back at the margins in characteristic fashion. Within the colour is a shining brick-scarlet with a black central blotch; outside the colour is a little

lighter. There are rare colour variants, some pale yellow with red markings, others with a clear yellow base ; and some of these forms approach closely to *T. Kaufmanniana*, with which it will hybridize. *T. Greigii* grows reasonably well but rarely makes an offset, so that it can be freely increased only from seed.

T. Eichleri (fig. 74) from Turkestan is probably the best of all the species for the general garden, a Tulip which grows to the height of about a foot, with glaucous foliage and a flower of shining crimson-scarlet with a black base margined with yellow. The backs of the outer petals are lighter in colour ; when fully expanded the pointed petals reflex to a wide-open flower. There are two clonal forms in general cultivation ; in the rarer one the petals are broader, deeper in colour though even lighter on the backs, and the blotch is deeply indented to a V in the centre, the flowering season being a few days later. *T. Eichleri* is a healthy vigorous Tulip that increases freely and cannot be excelled for its glowing colour.

T. Fosteriana from Bokhara is a dwarf Tulip rarely more than a foot in height in its typical form, with immense broad leaves and a great crimson-scarlet flower with the usual black blotch margined with yellow. It opens wide and may be 6 or even 8 inches across. Numerous variants occur : the foliage may be glaucous or glabrous, sometimes with a narrow purple line on the edge of the leaves ; the petals may be long and relatively narrow or form a close-fitting cup ; the black blotch may become clear shining yellow ; one noble form grows to 24 or 30 inches in height. *T. Fosteriana* is a vigorous grower, though it does not increase so freely as *T. Eichleri* ; it is worthy of the best conditions that can be given to it.

These four species—*Kaufmanniana*, *Greigii*, *Eichleri*, and *Fosteriana*—form a natural group which approach one another in their variants so closely that they may prove to be no more than geographical races of one common stock, but coming as they do from thinly populated, almost desert country in Eastern Asia, their distribution has never been studied in detail.

One other member of this group is worthy of a place in the select garden. *T. praestans* is a Tulip of medium height, 12–18 inches, upright in growth with numerous leaves possessing a characteristic V-shaped channel down the midrib, and carrying a bunch of two, three or four flowers. In the form most usually seen these are somewhat smaller than those of *Eichleri*, a pale scarlet in colour and without a glossy surface ; the filaments are scarlet. There are other forms in cultivation with dark purple filaments and darker, looser blooms, differing too in the habit of growth and in the pubescence of the stem and leaves. The multi-flowered habit is not desirable in a Tulip, and *T. praestans* lacks the grace of the other species ; moreover it becomes somewhat top-heavy and easily blown over. None the less it should be grown for its colour and freedom of bloom.

I have said nothing about the so-called neo-Tulips of Italy and Savoy like *T. Didieri*, *T. Marjolettii*, etc., nor of the older Tulips that



FIG. 71.—TULIPA HAGERI.

[To face p. 244.



FIG. 72.—*TULIPA POLYCHROMA*.

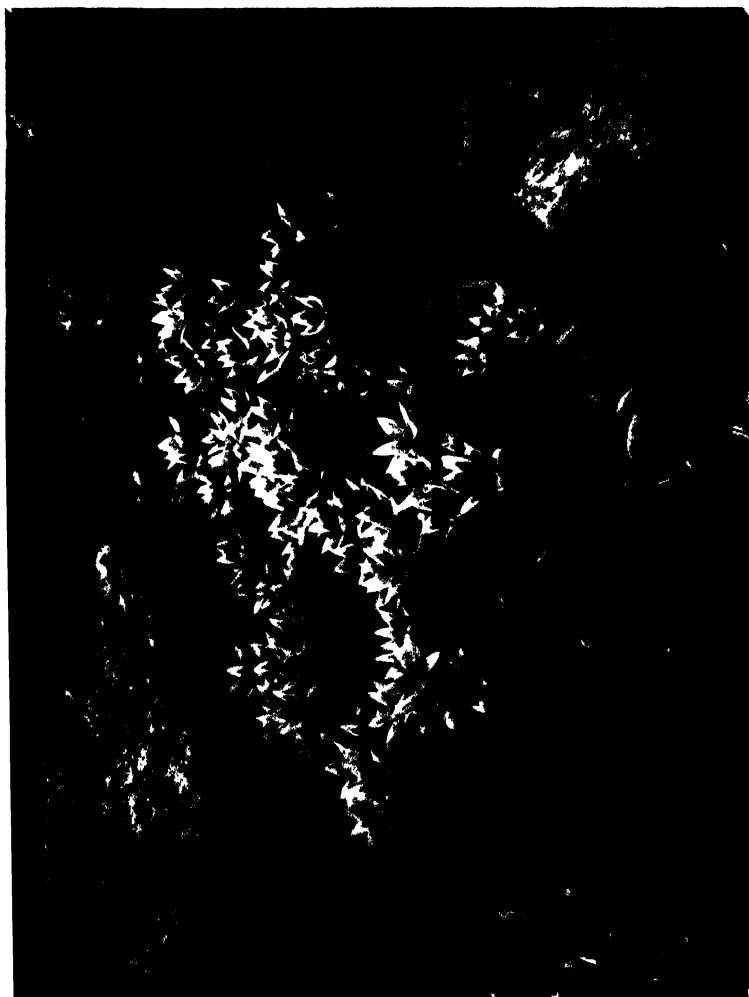


FIG. 73.—*TULIPA TARDA* (*T. DASYSTEMON*) ON THE ROCK GARDEN.
JOHN INNES HORTICULTURAL INST., MERTON.



FIG. 74.—TULIPA EICHLERI.

[To face p. 245.

carry specific names in the catalogues, like *vitellina*, *retroflexa*, *acuminata*, etc. They are all clonal selections from the great garden Tulip complex, in the case of the neo-Tulips originating from escapes from cultivation, while the others began as seedlings of horticultural derivation. None of them have truly wild counterparts or deserve specific rank.

A few hybrids have been raised in which the large-flowered species participate, and we may anticipate novelties which combine the brilliancy of the species with the vigour and prolific habit of some of the Darwins or Cottage Tulips. But, however great their glories, the true plant lover will always maintain a place in his garden for the species themselves.

NEW ALPINES.

By Dr. HUGH ROGER SMITH.

[Read Tuesday, March 19, 1935 ; Dr. F. STOKER, F.L.S., in the Chair.]

WHEN the Council of the Royal Horticultural Society did me the honour of asking me to lecture on New Alpines they left the definition of what is a New Alpine to me, and for the purposes of this paper I have arbitrarily defined the term to apply to Alpine plants that have been definitely introduced into cultivation within the last five years. Until I began to collect material for this paper I did not realize what a large number of new introductions there have been during this period, and I find it impossible to attempt to include them all. I shall not touch on Lilies—they have been so recently exhaustively discussed at the Lily Conference that any reference to them would be redundant, and neither shall I mention *Nomocharis* for the same reason. Although amongst the bewildering number of new *Rhododendrons* there are quite a number of dwarfs suitable for the rock garden, I am not mentioning them, largely because I confess *Rhododendrons* are a *terra incognita* to me, and as something had to be omitted I felt they must go. I do not profess that my list is a complete one, and I feel sure that at the end of my lecture there will be some who will express surprise that such and such an important plant has not been mentioned. I felt it essential to have pictures of all the plants referred to, and some have had to be omitted because I found it impossible to obtain reproductions of them. Just a word about the slides. I am indebted to Mr. MERRETT of Felbridge for a large number of beautiful photographs taken at Mr. MILLARD's garden at Camla and to Mrs. MALBY for photographs mostly of plants shown at the Alpine Garden Society's shows and many already figured in that Society's Bulletins, and to various friends who have kindly lent me photographs. With the exception of some half-dozen slides that Mrs. MALBY has made for me, I am responsible for making all the slides, so I must shoulder the responsibility for any deficiencies that may be observed in the views, for I can assure you they will not be due to any faults in the original photographs. Before passing to the plants I feel I ought to pay a tribute of very grateful thanks to the intrepid explorers who have made the introduction of these new Alpines possible, to KINGDON WARD, GIUSEPPI, COMBER, BALL, INGWERSEN, LOFTHOUSE, Miss STAFFORD and CLARENCE ELLIOTT, to mention only a few of the more recent explorers. I know something of the hardships one has to put up with in such civilized countries as the Balkans and Czechoslovakia when plant-hunting, but in the wilds of Burma and Tibet it must be a very arduous task indeed, and in Persia and the wilder parts of Albania, Bulgaria, Turkey

and the Andes it is a very strenuous game: all honour to these pioneers for their splendid work.

I think no one would deny that to REGINALD FARRER more than to anyone else we owe the stimulus to the study and growth of Alpine plants, and his name must not be omitted from this honourable list.

I feel that the most convenient method of introducing my subject is to mention new plants belonging to the various orders in sequence rather than grouping them according to their place of origin, and we will therefore start with Ranunculaceae.

Anemone patula obtusifolia was introduced from Burma by Lady WHEELER CUFFE. The flowers are a wonderful shade of blue with rich golden anthers. It is easy of cultivation, but somewhat difficult to propagate. It was well shown by Lisadell Nurseries at the R.H.S. Autumn Show at the Crystal Palace in 1934.

Aquilegia Jonesii is a new introduction from the Rockies and is the smallest of the American Columbines. The leaflets are small and tufted, rising scarcely an inch above the soil, and the flowers are carried just above them, are $1\frac{1}{2}$ inch long with straight spurs, blue sepals and pale-blue petals. Shown April 1932 by Dr. GIUSEPPI.

Semiaquilegia adoxoides is a spurless Aquilegia from Western China and Siberia that was known to FARRER and named by him *Aquilegia ecalcarata*. It is, of course, not a new Alpine, but I cannot discover that it has been in cultivation until recently and it is certainly an acquisition. It is a graceful little plant, its green leaves tinged with brown and with pretty cream and chocolate flowers.

Ranunculus Lyalli cannot be described as a new Alpine, for it was discovered by Dr. LYALL in 1847 and was grown and flowered at Beeches Nursery in 1879 and at Kew in 1882, but it seems to have quite gone out of cultivation until Mr. MILLARD showed us how it could be grown at Camla, which is my excuse for mentioning this very beautiful plant.

Corydalis cachemiriana made its first appearance at the Spring Show of the Alpine Garden Society 1934, when shown by Mrs. MILFORD, and created quite a sensation at the show. It is a most dainty little plant with typical Corydalis leaves, from amongst which rises a short stalk bearing large Fumitory-like flowers of pure Cambridge blue. It is of questionable hardiness coming as it does from the temperate Himalayan regions, but is very suitable for the alpine house. It seemed to be impossible to photograph the plant satisfactorily, and the slide I show I made from a water-colour sketch kindly provided by Mrs. ANLEY.

Viola delphinanthae.—A new introduction from Mt. Olympus and found also in Southern Bulgaria. It is somewhat bushy in habit, with small serrate, lanceolate leaves and bears large rosy lilac flowers with long spurs. It likes a rocky fissure in sun and protection from damp in winter. It was introduced by Dr. GIUSEPPI. Dr. SCHACHT of Sofia says of this plant, "This is by far the finest Alpine I have ever seen."

Viola Grisebachii was collected by Dr. GIUSEPPI at 6,000 ft. on mountains of Northern Albania. The leaves are small, oval and purplish; the flowers are rounded in outline and of a soft pale blue on 2-inch stems. Shown at A.G.S., April 1932.

Viola saxatilis var. *aetolica* was introduced by Mr. G. P. BAKER from Greece and shown in May 1931. It belongs to the Tricolor section and has the characteristic loose habit of this group; the flowers are bright yellow, the basal petal having five black lines towards the throat. It is biennial. It comes readily from seed.

Polygala pauciflora is a new introduction from Ontario, Canada, and is very attractive. It forms a little bush, the blooms appearing as spikes of soft deep crimson with projecting tufted spines from the lower petals, hence the local name of Tufted Polygala. It is perennial and does best in the limeless moraine.

Lewisia columbiana rosea is a good new introduction from Oregon in N.W. America. It forms basal rosettes of narrow fleshy leaves, and the flower stems arise 9 to 12 inches bearing numerous star-shaped vivid magenta flowers.

Lewisia Heckneri is a very good new introduction from N. California, where it was discovered by Mr. HECKNER, a woodman. The leaves are serrate, with curious short fleshy protuberances, easily distinguishing it from the other members of the *Howellii* group. The flowers resemble those of *L. Howellii*, and are large and white with conspicuous bright pink stripes. Shown by Sir WILLIAM LAWRENCE, May 1933.

Geranium subcaulescens is not a new Alpine, but is new to cultivation and was introduced by Mr. INGWERSEN from Serbia in 1929. I know he considers it one of the best plants he has introduced. I have a special interest in the plant for Dr. SELIGMAN and I discovered it on the north face of Kajmakalan on the same day that Dr. GIUSEPPI and Mr. INGWERSEN found it on the southern slopes. It is a dwarf tufted plant with large glowing carmine flowers with a dark centre. It is of easy cultivation and is fairly readily raised from seed.

Prunus prostrata grows in Greece and Crete and has been known for a long time, but I cannot find that it has been successfully cultivated until Mr. G. B. BAKER introduced it recently from the Atlas mountains of Morocco, and showed it in April 1933. It forms a dwarf twiggy shrub, clothed with small oak-like leaves spangled with small reddish-brown flowers in May.

Diosphaeria dubia is a treasure from Mt. Olympus, where it is found growing from tight cracks in the limestone cliffs. It forms a small bushlet with coriaceous leaves with serrated edges and fluffy heads of attractive blue flowers. It is quite hardy and easy in a crevice. We are indebted to Mr. INGWERSEN for its introduction.

Saxifraga Spruneri is rare in nature, being confined to Mt. Olympus and Mt. Parnassus and one or two other Greek mountains, and it is doubtful if the true plant has been in cultivation until recently, the plants called *S. Spruneri* belonging usually to a form of *S. scardica*.

It is one of the Marginata group, but is distinct in having hairy leaf rosettes which form a tidy hump of grey-green. The flowers are carried in a dense flat head. Dr. ROGER BEVAN showed it in April 1933.

Sedum Praegerianum is an attractive Sedum from Tibet. It is not a new introduction, having been grown at Edinburgh in 1913 from a few seeds taken from an herbarium specimen, but although twenty years old it is still decidedly rare in cultivation, due probably to difficulty in propagation, and this is my excuse for including it here. The plant forms a stemless rosette of narrow fleshy leaves from which radiate numerous leafy stems ending in a freely branching lax cyme, each branch carrying several large pink flowers. Shown by Mr. INGWERSEN in 1932.

Anacyclus depressus is a new-comer from high up in the Mt. Atlas in Morocco. It forms a prostrate tuft of finely serrated silvery grey leaves from which radiate prostrate leafy stalks ending in a large upturned Marguerite flower, glistening white within, rich red on reverse of the florets and with a reddish-yellow disc. The plant is hardy, but appreciates protection from winter wet. If happy it seeds itself in the moraine. Shown by Mr. INGWERSEN at A.G.S. in May 1931.

Arnica nana is an American plant and is, as far as I can discover, a new introduction here, and was raised by Mr. MILLARD; it is a dwarf and brilliantly coloured member of the family, of a rich gold colour and well worth growing.

There have been a number of good new Campanulas introduced to cultivation during the last five years and the first I shall mention is *Campanula Formanekiana*, a beautiful monocarpic species found by Dr. GIUSEPPI on Mt. Kajmakcalan in 1929 and introduced by him. It forms a single rosette of crinkled downy grey leaves, from which arises the tall stem bearing a number of very large white bell-shaped flowers. At the time that Dr. GIUSEPPI found this plant on the south face of Kajmakcalan, Dr. SELIGMAN and I were working on the north face and discovered a Campanula very similar if not identical with GIUSEPPI's find, but with faintly blue flowers. It was impossible to remove it so I contented myself with taking a colour photograph of it.

Campanula Hawkinsiana is one of the special glories of Mt. Smolika. The leaves arranged in pairs on rather straggling stalks are bluish-green with jagged edges and covered with a felt of small hairs; the open bells set at the end of the branches are a rich purple. It was found by Mr. ATCHLEY and Mr. INGWERSEN in 1929, but all the plants sent home died. The following season Drs. GIUSEPPI, JENKIN and BEVAN revisited the mountain, but only one plant of those collected survived and was shown by Dr. BEVAN in June 1931. It is satisfactory that cuttings have been successfully struck.

Campanula tubulosa is a saxatile bell flower from Crete, with hairy leaves, spreading calyx lobes and tubular flowers of a transparent blue and is only biennial. It received the Award of Merit of R.H.S. in 1933 when shown by Dr. GIUSEPPI.

Campanula rupestris comes from the mountains of Greece, where seeds were collected by Mr. C. S. ATCHLEY. From neat tufts of greyish-green, hairy, fiddle-shaped leaves the flower stems rise and spread in an intricate mass and are covered with quantities of pale blue flowers. It is perennial, but of rather doubtful hardiness. There seems to be considerable confusion about this plant. Some six species have been named *rupestris*, but ATCHLEY's plant seems to be a definite species and new to cultivation.

Campanula rupicola is found only on Mt. Parnassus and was introduced by Dr. GIUSEPPI. It is saxatile. The leaves are small, oval and toothed, and the flowers are long violet bells.

Campanula saxatilis was introduced by Dr. GIUSEPPI from Crete and received the Award of Merit of R.H.S. in 1933. It is perennial and a true saxatile, consisting of many branches, each bearing a tubular flower of rich sapphire-blue.

Campanula Piperi is a new introduction from the Olympic Mountains of Washington, where it grows at 6,000 feet. It is a true saxatile and grows in the cracks of the cliffs. The leaves are $\frac{1}{2}$ to 1 inch long, dentate, acute at apex, dark green with a definite sheen. The flowers are a soft china blue with five cleft corolla. The plant is hardy and fairly easy to manage.

Campanula lasiocarpa has recently arrived in this country from Japan. It forms a neat tuft of ovoid serrated leaves, from which arise numerous 2- to 3-inch stems bearing large blue bells. It seems accommodating and easy to manage.

Edraianthus niveus has been known at Kew for some time from dried specimens, but was first introduced into cultivation by Dr. GIUSEPPI in 1930 from Krstac, a mountain in Yugoslavia. The leaves are short and narrow, and the pure white upturned bell-shaped flowers are large for the size of the plant.

Cyananthus integer was known to FARRER, but has only recently been introduced into cultivation. It grows on the Kumaon Mountains, the home of *Primula Reidii* and other treasures, and was raised from seed at Wisley, where it formed a dense mat with wiry stems and dark green hairy leaves, from which arise large dark blue tubular flowers as much as an inch in diameter. Award of Merit, October 1934.

Cyananthus longiflorus was discovered by DELAVAY, so it is not a new plant, but it is only recently that it has been successfully cultivated from seed sent home by FORREST. The slide shown is of a plant growing at Bodnant, where all the *Cyananthus* group seem to flourish so amazingly. The flowers are deep blue and markedly tubular and nearly 2 inches long, with erect lobes and beard at the throat. The foliage is silver-grey.

Cyananthus macrocalyx was discovered by DELAVAY in Tibet in 1885, but I can find no record of its introduction into cultivation. I took a photograph at Wisley last year, the plant having been raised by Mr. WALL. It forms a rather dense mat of dark green rhomboid leaves, and the flowers are yellow and rather on the small side.

Phyllodoce aleutica, a little N. American shrub and a new-comer, with pale green leaves and greenish-white flowers, is very dainty and useful for a cool corner in peaty soil. It was shown by Dr. GIUSEPPI in 1933.

Primula gemmifera was discovered by REGINALD FARRER, who sent home seed from Kansu, but it had been lost to cultivation until Mr. INGWERSEN showed it at the A.G.S. June Show in 1932, and was described by Sir WILLIAM LAWRENCE as the most interesting plant brought before the Committee. The plant, which is a good perennial, forms a neat basal rosette of leaves which are farinose and bears firm heads of rosy-lilac flowers, which are sweetly scented, on powdered stems.

Primula sonchifolia was discovered by the ABBÉ DELAVAY in 1885, and since then seed was sent home by FORREST, FARRER and KINGDON WARD with practically no result in the way of germination. In 1929 Sir CHARLES INNES, Governor of Burma, sent home seed in a thermos flask and many plants were raised from them at Bodnant and Edinburgh Botanic Gardens, and later actual plants in the dormant stage were despatched in cold storage and these were successfully flowered by Mr. HAY and received the R.H.S. Silver Lindley Medal in February 1931, and in April the same year the plants raised from seed at Bodnant were in flower. The reason for previous failure was that the plant sheds its seed green and resents their being dried. The leaves are grey-green, thistle-like and toothed, and may be 10 inches in length and covered with farina. The scape rises 6 inches and the flowers form a cluster and are of a beautiful turquoise-blue. The plant belongs to the Petiolaris group, the only other member of this section in cultivation being *Primula Winteri*.

Primula tosaensis is a rare *Primula* from Japan belonging to the Reineri group and is a new-comer. It is smaller than Reineri and makes tufts of membranous, deep green hairy leaves on short stalks. Arising from the tufts are stems 3 or 4 inches long bearing 3 or 4 long-tubed, yellow-throated, magenta-pink flowers, with rounded bifid petals. It does best in the alpine house.

Dionysia ianthina was one of the special treasures found by Dr. GIUSEPPI in Persia on Schir Kuh. This plant forms cushions of little rosettes covered with pink flowers. Some of the cushions measured a feet across. The *Dionysias* are closely allied to the *Androsaces* and are peculiar to Persia and Afghanistan. Dr. GIUSEPPI was able to obtain seed and these have germinated, and the resulting plants are doing well, and we may hope to see them in flower this spring.

Several good *Gentians* have been introduced to cultivation during the last few years, and first I would mention is *Gentiana acaulis*, Giant form, which Mr. TROTTER introduced from Switzerland and for which he received an Award of Merit in April 1933. It is a fine thing and a distinct improvement on the type plant of which it is apparently only a variety.

Gentiana ornata.—We owe the introduction of this plant to Mr.

HAY. Several Gentians have been figured under this name, specially *G. Lawrencei*. The first knowledge of the true plant reached this country in 1820, but the first living plants arrived in 1930. The plant consists of low-growing rosettes of small leaves with many trailing stems, each bearing a terminal light blue flower.

Gentiana Waltonii was described as long ago as 1906, but was not introduced into cultivation till 1929 by Capt. KINGDON WARD, but I have ventured to include it as a new Alpine as it has only recently become established, for it is a difficult plant in cultivation and needs a sheet of glass or bracken over the crown in winter. The leaves resemble those of *G. decumbens*, and the flowers are large and of a good blue.

Gentiana Loderi.—Seed of this plant was sent to Sir EDMUND LODER and plants raised by him in 1883, and these were named and figured by HOOKER. Nothing more was heard about it until Mr. MUSGRAVE recently grew it again successfully. The plant rather closely resembles *G. cachemirica* recently introduced through Mr. B. O. COVENTRY from Kashmir. The leaves are silvery grey, and the loose trailing stems bear terminal blue flowers.

Gentiana gilvostriata, a fine plant recently introduced from Tibet by Capt. KINGDON WARD and growing well at Bodnant. It has silvery foliage and short open recurved bells of pale blue with darker markings. It flowers in August. A plant was shown at the last R.H.S. Fortnightly Show, but it did not give a good idea of the beauty of the plant, and the foliage was quite out of character.

Gentiana saxosa is a recently introduced Gentian from New Zealand. It is a perennial and forms a clump of rosettes from which the flower stems rise 3 to 4 inches. The leaves are thick and fleshy, spoon-shaped, and taper off into a long petiole and are dark green tinged with purple. The flower stems bear 1 to 5 flowers, white with purple lines running up from the base, and are $\frac{3}{4}$ inch in diameter.

Gentiana bellidifolia is another New Zealander of recent introduction, and like all the New Zealand members of the genus bears white flowers. The plant makes a mat of strap-shaped leaves of a reddish shade and from this arise 4-inch stems carrying many white stars. It is perennial and flowers in September.

Gentiana scarlatina, introduced by Miss STAFFORD in 1933 and shown by Lord ABERCONWAY this summer at one of the R.H.S. shows, is remarkable as the only red-flowered Gentian yet known. Miss STAFFORD describes the flower as having deep golden yellow cups, the reverse of each petal equally divided, half scarlet and half yellow. The idea of a red-flowered Gentian caused considerable excitement, but I think the flowering plant shown was rather disappointing.

Gentiana × *Macaulayi*.—In this paper I am confining my remarks entirely to new Alpine species, but I am making an exception in the case of this garden hybrid, which we owe to that wizard amongst Gentian growers, Mr. MACAULAY, because it is such an outstanding plant. It is a hybrid between *G. Farreri* and *G. sino-ornata* and com-

bines the beauties of the two plants. It is undoubtedly easier to grow than *G. Farreri* and flowers well before *G. sino-ornata*.

Lithospermum prostratum var. *erectum* was collected and introduced by Mr. INGWERSEN from N.W. Spain in 1928 and shown in May 1931. It forms an erect shrub 1 foot high, with the hairy leaves of the type, and at the very tips of the shoots produces deep blue flowers. Although only a variety, it is very distinct and a fine introduction.

Nierembergia hippomanica is a native of the Argentine. It is new to cultivation over here, and we are indebted to Mr. HAY for its introduction. We ought to be very thankful to him, for it is a very lovely thing. It forms a compact plant some 6 inches high; the stems are wiry and set with narrow leaves, and the flowers $1\frac{1}{2}$ inch in diameter of a delicate lavender, while the anthers and centre of the corolla are a golden-yellow. My specimen flowered continuously from June to September. The plant received an Award of Merit at the R.H.S. in June 1933.

Polemonium confertum is a N. American plant of great charm. It was shown by Dr. ROGER BEVAN at the R.H.S. in the spring of 1929, and as far as I can ascertain was not in cultivation in this country before. It has the typical *Polemonium* feathery foliage, and the flower stem carries a head of fragrant violet flowers.

Phlox adsurgens is a new introduction from the mountains of Oregon, North America. It forms loose mats of woody branches with bright green glossy leaves, and freely produces clusters of large pink flowers with carmine stripes. It is hardy and not fussy, and is readily propagated by cuttings. It grows in half-shady woods in Oregon and N. Carolina, and Mr. GABRIELSON considers it the outstanding beauty of all west coast natives. It was shown by both Dr. GIUSEPPI and Mr. INGWERSEN in June 1931.

Schizocodon macrophyllum has only been in cultivation in England for a year or two. The leaves are as big as Ivy leaves and very glossy, and the pink tubular flowers are carried in clusters of a dozen or so. It comes from Japan and is a plant for the alpine house or cool woodland site. It was shown by Mrs. STOKER in May 1933.

Oreocharis primuloides is another Japanese plant of recent introduction which is better adapted for cultivation in the alpine house than out of doors. Its rounded evergreen leaves are hairy, and above these hang umbels of two to twelve *Streptocarpus*-like flowers of cool lilac with a white throat. It was shown by Dr. GIUSEPPI.

Wulfenia Baldachii was discovered by Dr. BALDACHI in 1897. Dr. GIUSEPPI found it in 1929 on the mountains east of Lake Scutari in Albania. It is a shade lover and spreads by underground stems. It grows on limestone rocks and the flowers are lilac-blue. Shown by Dr. GIUSEPPI, May 1931.

Linaria filicaulis was introduced into cultivation by Dr. ROGER BEVAN from the limestone screes on the Picos de Europa in Northern Spain. It is like a magnified form of *Linaria alpina rosea*, is perennial and is a very pretty thing.

Calceolaria Darwinii is not a new plant for it was discovered and described by Darwin in 1847, but it was Mr. CLARENCE ELLIOTT who introduced it into cultivation from Patagonia and received an Award of Merit in 1928, but until recently it was very rare in cultivation, and I have included it in my list as it is such a lovely thing. It has a dwarf running habit and carries very large solitary flowers on 2- to 3-inch stems. The flowers are deep gold flushed crimson, with a broad band of waxy whiteness across the lip. I find it does well in the granite moraine.

Thymus membranaceus was found by Mr. ASHTON LOFTHOUSE 5,000 feet up on the Sierra Nevada in Spain in 1926, and it received an Award of Merit in 1930. It forms a dense greyish-green sweetly scented cushion with large upstanding heads of white bracts with white tubular flowers coming in between. It is a very striking plant when well grown. It is hardy and seems to do best in a slaty compost.

Weldenia candida is a native of Mexico and Guatemala and was first discovered by Ehrenberg in Mexico. In 1840 HARTWEG collected it in the crater of Volcan de Aqua in Guatemala, and in 1894 specimens were received from there and flowered the following April in a cool greenhouse; it then appears to have been lost and has only recently been reintroduced into cultivation, Mr. BARTHOLOMEW of Reading being, I believe, one of the first to grow it successfully. It has deep green, leathery strap-shaped leaves, forming basal rosettes of about 4 inches in diameter. Flowers are carried on 2-inch stems, four or five per stem, pearly white in colour and about 1 inch across. The root system consists of numerous fleshy tubers. It is reputed to be very difficult, but I saw recently a plant growing at Bodnant that was so rampant that it had grown under the retaining stone slab and had invaded the next compartment. The crater from which the plants were collected was supposed to be extinct, but it has recently started to be active, with the result that all the *Weldenia* plants have been destroyed. The plant was shown by Dr. GIUSEPPI in June at the A.G.S. Show.

Fritillaria karadaghensis is a recent introduction from Kara-dagh in Northern Persia, where it was found by Mr. GEORGE EGGER. It was shown by Mr. G. P. BAKER at A.G.S. April Show in 1931. It grows only 6 inches high, has pale lanceolate leaves which exceed the flower stem in length; the flowers at first nodding, later become semi-erect and open; the colour is a combination of yellow, green and brown. It is a good subject for the alpine house.

Fritillaria Karelinii comes from the neighbourhood of Tabriz in Persia and was introduced into this country and flowered nearly a hundred years ago, but it seems to have passed out of cultivation. A specimen of this plant was shown by Dr. GIUSEPPI at the A.G.S. Show in 1935, which he had brought back from Persia, and it was again shown at the R.H.S. Show on February 5 of this year among the Hocker Edge collection of bulbs and received an Award of Merit on the following show. It is a most attractive plant; it hardly suggests

a Fritillary for the flowers are a soft brownish-pink and open out flat and vertical on stems some 6 inches high, and have at the back of each petal a definite horn-like protuberance; hence the name *Rhinopetalum* by which it was formerly known.

Rhodohypoxis Baueri is a recent introduction from the Drachenberg Mountains of S. Africa, and I believe Messrs. BAKER of Wolverhampton were responsible for introducing it. The bulbs are very small; the leaves are dark green and pointed and from amongst these rise in April bright pink flowers with six petals; a most attractive plant. There is a white variety quite as beautiful as the type.

Mr. J. HUTCHINSON has recently put this plant into a special order Hypoxidaceae and calls it *Hypoxis Baueri*.

Narcissus Watieri discovered by M. WATIER and introduced by Mr. G. P. BAKER in 1930 from the High Atlas Mountains. Leaves two to a bulb, scape 9 inches long, bearing white flowers $1\frac{1}{2}$ inch in diameter with pale yellow anthers.

Narcissus rupicola, introduced by Dr. GIUSEPPI from the Sierra de Guaderrama and shown at A.G.S. Show April 1931. It is allied to *N. juncifolius* and has leaves about 6 inches long, flowers bright yellow and fragrant, carried on 5-inch stalk, are 1 inch across and the corona only protrudes $\frac{1}{2}$ inch. It is hardy and can be raised from seed.

Narcissus scaberulus is only found on one mountain near Oliviera do Conde in Portugal, and introduced from there by Dr. GIUSEPPI and Mr. INGWERSEN, and received Certificate of Merit, April 1932. It is the smallest of the Narcissi. Leaves two to a bulb, short and prostrate; flowers orange-yellow on $2\frac{1}{2}$ -inch scape, $\frac{1}{2}$ inch in diameter and fragrant.

PLANTS FOR THE SMALL GREENHOUSE.

By E. R. LUCKHURST, F.R.H.S.

[Read Tuesday, March 5, 1935; W. HALES, Esq., A.L.S., in the Chair.]

Plants for the Cold Greenhouse.

I WILL deal with the cold greenhouse first, as naturally all subjects that are suitable for the cold greenhouse can be grown in heat, providing a certain amount of discretion is exercised. There is a prevalent idea that if a greenhouse is unheated it is useless during the winter months, but this is not so. One cannot, of course, have a lovely display of flowers in a cold greenhouse round about Christmas time; if such a thing were possible, nurserymen would not spend thousands of pounds a year on fuel. It is possible, however, to have the greenhouse looking at least cheerful from November to February, the four dullest months, and I hope the following suggestions will help you to attain this.

A few small evergreen shrubs grown in pots will make a vast difference in the appearance of the house, and can be selected from the following: *Cupressus obtusa nana* (a very ornamental little shrub), *Osmanthus ilicifolius variegata*, *Cupressus Fletcheri*, *Juniperus japonica aurea*, *J. Meyeri*, *Euonymus latifolia variegata*.

These shrubs can be moved from the house in the spring, when the space is required for other purposes. The best method of keeping them after moving out of the house is to plunge them in the ground up to the rim of the pot in a shady place. It is essential that they should be kept well watered during the summer, and it is also necessary to twist the pots round about once a month in order to prevent the plants rooting through into the ground. Alternatively they can be knocked out of pots and planted in the rock garden, until such time as you are ready to bring them back into the house. Then, say at the end of October, they could be lifted and repotted, care being taken to lift with a good ball of soil.

There are also many Alpine plants which, though not actually in flower during this period, have quite a charm of their own, such as the *Primula denticulata*, *P. 'Wanda'*, and many Saxifrages. Aubrietias also will make quite a good display, and when they have finished flowering they can be cut over and planted out, where they will flower again later.

Of flowering shrubs a really good display can be had at quite a small cost. Such subjects as *Forsythia*, *Prunus triloba*, *Spiraea arguta*, *Spiraea Van Houttei*, *Jasminum nudiflorum*, *Ceanothus*, *Viburnum Opulus* (Snowball Tree), *V. Carlesii*, *Azalea mollis*, *A. Hinodegeri* (red), *A. Hinomayo* (pink), can be recommended. Pot-grown plants should

be obtained in November, potted up and placed in a sheltered position outside and taken into the greenhouse in January. Immediately after flowering they should be pruned back hard, and plunged in the same way as suggested for the evergreen shrubs. They should then be repotted in October preparatory to bringing them in again. It should be borne in mind that my remarks relative to pruning do not apply to Azaleas or Ceanothus. Two very satisfactory plants are *Primula malacoides*, of which there are some very fine strains—'Duchess of Kent' being exceptionally good—and *P. × kewensis*. These have been in full flower since early January this year, and while it is true we have had no severe weather to contend with, both are almost hardy if careful attention is paid to watering during cold weather, it being essential to keep the plants almost dry.

Very good results can be obtained at little cost by using such plants as Canterbury Bells, Geums, Sweet Williams, Myosotis, Lupins, Delphiniums, Aquilegias (Columbines) and Scabious. The best method is to lift and pot the plants early in October, using 6-inch pots. They should then be placed in a sheltered position, and brought into the greenhouse early in January. Very little water is required until growth actually commences. It is also important to see that all decayed leaves are removed from the plants and plenty of air admitted. Violas also will give a very bright display early in March if they are lifted in January and placed in pans; they must, however, be kept fairly near the glass, otherwise they will get drawn and spindly.

Polyanthus and coloured Primroses will also give an early display. These should also be lifted in January, but for the house should be grown in pots. *Dielytra spectabilis* (Bleeding Heart) makes a very showy pot plant. Roots should be obtained in November, potted into 6-inch pots, and plunged outside in a sheltered position, and taken in at the end of January. Lily of the Valley potted in November, six crowns in a 5-inch pot, makes an early show. *Helleborus niger* (Christmas Rose) is a most valuable plant for the cold house. Procure good clumps in November, and pot up and place in the lightest part of the greenhouse.

Three other ornamental hardy plants for the cold house are *Centaurea Ragusina*, *Leucophyton Brownii* and *Epacris* 'Sunset.'

We now come to bulbs. The earliest to come into flower are Polyanthus Narcissus 'Paper White,' Roman Hyacinths, Snowdrops, Crocuses, and Winter Aconites. If potted in August or early September they will flower early in the New Year, and often in a mild season earlier.

These will be followed by Hyacinths and Daffodils—'Golden Spur' and 'King Alfred' being two very good early varieties of the latter. Of Tulips, the small scarlet 'Duc Van Thol' is the first to flower, followed by 'Chrysolora' (yellow), 'Fred Moore' (terra-cotta), 'Keizerskroon' (scarlet, edged yellow) and 'Rose Grisdelin' (rose). The following small bulbous plants are of easy cultivation, and will give an added interest: *Scilla sibirica*, *Iris reticulata*, *Chionodoxa*,

Anemone fulgens (scarlet), *A. blanda* (blue), but, to get the best results, fresh bulbs are necessary each year. The bulbs that have been forced can, however, be planted out into the border immediately they have finished flowering, and, if left undisturbed, will all flower the following spring, with the exception perhaps of *Iris reticulata*.

Of climbing plants for the cold greenhouse, Blue Passion Flower, *Solanum jasminoides*, *Clematis lanuginosa* types, and, of course, Climbing Roses, any good Hybrid Tea variety, are all suitable. The annual climbers, *Cobaea scandens* and *Eccreomcarpus scaber*, can be raised from seed sown in February or March. Personally I am not much in favour of climbing plants in the small greenhouse, unless it is to cover a bare wall. It seems to me to be such a waste of valuable space and invariably leads to certain types of insect pests, such as Mealy Bug and Red Spider.

Bush Roses in pots make quite a good feature, and can be carried over from year to year. Procure pot-grown plants in January, or if desired you can pot up plants early in November. Place them in a sheltered position, bringing them into the greenhouse about the middle of January, when they should be pruned back to two or three eyes. If freshly potted plants are used, do not leave more than two eyes to each shoot. After flowering, say about the end of June or early July, plunge the plants out of doors in a sunny position, and report the following October.

Quite a bright display of colour can be obtained in April and May at a small cost from hardy and half-hardy annuals from seed. Any of the following are of easy cultivation: Clarkia, Godetia, Nasturtium 'Golden Gleam,' and the new Gleam hybrids. Eschscholzia, Viscaria, Dimorphotheca, Dianthus (Indian Pink), *Limnanthes Douglasii*, Nemophila, Calendula, Larkspur, Nemesia, *Phlox Drummondii*, Delphinium 'Blue Butterfly.'

The seed should be sown thinly in mid-August in a cold frame. Prick off into boxes or small pots when sufficiently large enough to handle, finally potting into 5-inch pots. Water very sparingly during the winter months, but admit air freely on fine days. As the plants develop, give sufficient space so that the foliage does not touch. In the event of very severe frost, sufficient protection can be afforded by placing a sheet of brown paper or newspaper over the plants. When the plants are past their best they can be cut back and planted out in the border, where they will continue to flower. Annuals can also be used for summer display. In that case sow at the end of March, but use 6-inch pots.

So far I have dealt only with plants that will give a display up to early May, but we now arrive at a season when a much wider range is possible. Begonia tubers can be started in February or March in boxes, but as a precaution the boxes should be covered each night. When sprouted to about 1 inch they should be potted off into 3-inch pots, and finally into 6-inch pots. These will give a display of flower from July to October. *Begonia semperflorens* is also a free-flowering,

useful little plant. Petunias, Fuchsias, *Agathea coelestis* (the small flowered Blue Marguerite), *Salvia Simonsii* (scarlet), *S. patens* (blue), Verbena, Heliotrope, Gloxinias, Carnations and Zonal Pelargoniums will also give a fine display until the autumn. Lilies will also be useful from early summer to autumn. The following are specially recommended for this purpose: *Lilium auratum*, *L. Brownii*, *L. chalcidonicum*, *L. longiflorum*, *L. regale* and *L. speciosum*. Pot firmly, barely covering the tops of the bulbs, and leaving room to add more soil when surface roots appear.

If Primulinus Gladioli are potted in early March, three corms in a 6-inch pot, they will give a good display about the end of June.

Chrysanthemums will now be the mainstay in the cold house. Quite a good display is possible up to the middle or end of November, the decorative and single types being the most reliable. The following are a few of the more suitable varieties. Decoratives: 'Market Red,' 'Cranford Yellow,' 'H. W. Thorpe' (white incurved), 'Romance' (yellow incurved), 'Tuxedo' (bronze), and 'Uxbridge Pink.' Singles: 'Absolute' (bronze), 'Daphne' (silvery pink), 'Mensa' (white), 'Phyllis Cooper' (yellow), and 'Miss Joyce Moore' (crimson). The following hints on their cultivation may be helpful. Small plants should be procured about mid-April and planted into the open ground. Keep well staked, and it will be found advantageous to disbud the plants that are going to be used for greenhouse display. Lift the plants about the end of September, and placing in large pots or boxes give a good soaking, and keep shaded for a few days. See that all dead foliage is removed, and admit plenty of air. Avoid overcrowding, as otherwise you will be troubled with mildew, but should this appear give a light sprinkling of sulphur.

This method, needless to say, will not produce exhibition flowers, but will give a good supply of bloom for cutting.

Plants for the Heated Greenhouse.

Climbers.—*Hoya carnosa* (Wax flower), Bougainvillea, Smilax, Lapageria, Plumbago, *Asparagus plumosus* and *Streptosolen Jamesoni* do well; while *Asparagus Sprengeri*, *Campanula isophylla* (blue and white), *Lobelia erinus* and *Tradescantia zebrina* are good trailing plants for growing in baskets.

Plants that can be had in flower December to March are Arum Lily, Azalea, Acacias, *Begonia semperflorens*, Cinerarias, Carnations, Cyclamen, Ericas, Primulas, Salvias, Spiraeas, Zonal Geraniums, and bulbous subjects as Daffodils, Hyacinths, Tulips, Crocuses, etc.

To flower from March to June.—Calceolarias, Freesias, Schizanthus, Primulas, flowering shrubs, Roses, Carnations, Clivia, Amaryllis, and the later batches of bulbs.

Summer flowering plants are Begonias, Cannas, Gloxinias, Heliotrope, Hydrangeas, Lilies, Oleander, Petunias, Salvias, Coleus, Fuchsias and Boronias.

Autumn flowering from September to December.—Begonias, Chrysanthemums, Carnations, Cyclamen, Zonal Pelargoniums, Salvias.

Other valuable plants are the ferns Adiantums, Aspleniums, and Pteris, the palm *Cocos Weddelliana*, a most graceful palm giving a light effect if raised slightly above other plants, and *Grevillea robusta*.

We now come to a most important point, that of temperature, and I intend to confine myself to the ordinary heated greenhouse. I shall not deal with what are termed stove plants, requiring a minimum temperature of 65 to 70, as there is such a limited number of owners of this type of small greenhouse, and those that do own them are usually well advanced in greenhouse management.

I will assume that with most small heated greenhouses a night temperature of 45 to 50 can be maintained. Of course, in exceptional conditions the temperature might drop to 40, but no harm will have been done. In fact, with the general run of plants, providing they are not kept too wet, even a lower temperature will have no ill effect. A point that needs to be watched most carefully, and where most harm is done, is to avoid violent fluctuations of temperature, especially in early spring. On bright sunny days it is important to see that the day temperature is not allowed to get too high. I realize that at times, even with all ventilators and doors open, the temperature will run up very high, but providing you have got all the air on that is possible, nothing more can be done. Very often at this time of the year a clear, bright sunny day is followed by a sharp frost at night. It is wise to close your house down fairly early, say about 3.30 to 4 P.M. in early spring, so as to retain a certain amount of heat and to avoid sudden fluctuations.

A little advice on stoking may be useful. Keep your fuel dry, otherwise a great deal of the power is lost, especially with coke. One often hears of trouble caused through the fire going out during the night. This is usually due to closing the dampers too far. It is much safer to err on the other side and give a little too much air to the furnace. No harm will come if the fire burns out, as it will have generated sufficient heat to keep the temperature safe until morning.

General Notes.

Soil.—Often a good deal of expense is incurred in the erection of the greenhouse, but when it comes to the most essential thing of all, soil, it is thought that ordinary garden soil will suffice. In a few instances one might find a garden which contains a nice friable loam, but this is an exception. Generally speaking, ordinary garden soil is not suitable for pot plants or for the raising of seedlings.

For general purposes the best mixture is : 3 pecks loam, 1 peck leaf mould or peat, and $\frac{1}{2}$ peck sand.

For general potting do not get your soil too fine. This is a mistake often made. Prefer a $\frac{1}{2}$ -inch sieve, or an even coarser mesh when potting Chrysanthemums into their large pots. If the soil is too

fine it will go down like cement, with the result that the roots cannot breathe, although, of course, fine soil is necessary for cuttings. Even when sowing seed I prefer a coarse soil with just a fine layer on the surface to sow on, covering the seed with fine soil. It is a wise plan, whenever possible during winter and spring, to get the soil into the greenhouse a few days before it is required. This will take the chill off and assist in the more rapid germination of seed, and in pot plants will help new root action. Never have the soil too damp when potting or sowing, otherwise you will find it will settle down so solid that the plants cannot thrive. Pot firmly, but do not ram down too hard, and always make sure when repotting that the plants are moist right through the ball. This is very important, because if the plant that is being repotted is dry in the centre, it is very doubtful if it will ever thrive.

After plants have been potted from three weeks to a month, prick over the surface of the soil. An old kitchen fork with the points bent over makes an ideal tool for this purpose.

Repotting.—Do not overpot; a move should always be gradual, as from a 3-inch to a 5-inch pot.

Seed Raising.—Failures can often be traced to the fault of using too deep a box or pot, with the result that the soil gets too wet and cold before germination can take place. The ideal seed-raising tray is one measuring 14 inches long, 9 inches wide by $2\frac{1}{4}$ inches deep. This is the recognized size for seed trays in the trade, and is also the right size for pricking off seedlings.

Seed Sowing.—There is often a tendency to commence sowing annuals, such as Zinnias, Stocks, Asters, etc., too early. There is no need to sow until the second or third week in March; if you get your seedlings too forward they will only be starved and drawn before it is safe to plant out. These remarks apply especially to Zinnias, as they cannot be planted out safely until the third week in May.

Keeping the Greenhouse Clean.—It is to be regretted that many people are most neglectful in this respect; especially with the rubbish that is allowed to collect under stagings, such as old sacking, broken pots, boxes, dead plants, etc. This rubbish, of course, affords an ideal breeding ground for all manner of insect pests, especially wood lice and slugs. Personally, I like to see the space under the staging quite clear, except when it is being put to some cultural use, such as forcing Rhubarb or Seakale. Cleanliness is even more important in the greenhouse than in the garden. In the garden you have the natural enemy of the insect—the bird—which is lacking in the greenhouse, or at least should be if the house is properly glazed. Near London it is important to have the outside of the glass washed twice a year, or at least once. In the latter case I would suggest the end of February, as all deposit left by fogs will then be removed. An occasional wash down of the glass from inside is also an advantage.

Drip accounts for a great deal of loss in plant life, especially in pans and boxes of seedlings. In the case of seedlings, where the drip

falls it usually sets up damping, which spreads rapidly, and often results in a good box of seedlings being spoilt. The remedy is seeing that your house is thoroughly painted and puttied. A temporary measure, if the fault cannot be remedied right away, is to attach a drip bar to the rafters.

Watering.—Special attention must be given to watering in the cold house, especially in the autumn and winter months. Much harm is done by over-watering, it being as a general rule much safer to keep the plants on the dry side. Where there is no provision for a water tank in the house, a can or bucket of water should be kept inside.

Shading.—In greenhouses exposed to the full glare of the sun shade of some form is necessary. Roller blinds are by far the most convenient, but are fairly costly. An alternative is a preparation called Summer Cloud, or ordinary whitewash will serve the purpose.

I have recently seen in use hurdles made with wood laths, which answer the purpose very well. All that is required to keep them in position is a few hooks or nails driven into the rafters of the greenhouse.

Greenhouse Pests.

Fumigation.—The first step is to ascertain the cubical contents of the greenhouse. In order to arrive at this, multiply the length by the breadth and the resulting total by the average height. A greenhouse, say 12 feet long by 7 feet wide and 7 feet high, would be approximately 500 cubic feet. Fumigation is best carried out at night, choosing a calm night for the operation, and making sure that all crevices are stopped up securely, as otherwise a great deal of the fumes escape. There are many types of nicotine fumigants on the market made up in sizes to fumigate from 500 cubic feet. Nicotine fumigation, though effective against Green and Black Fly, is of little use when it comes to White Fly. The most effective method of dealing with White Fly is the "White Fly Parasite." This can be procured from the Society's Gardens (see p. lxxxv). For Green or Black Fly fumigation is not always necessary, if you have only a mild attack. Spraying with a good nicotine wash will often be sufficient. Never spray during sunny weather, the best time as for fumigation being in the evening.

Ants.—There are now several effective preparations for the destruction of ants, so there is no need to go to the old trouble of trapping.

Red Spider.—This is a formidable plant pest, usually very prevalent in hot, dry seasons, and very destructive to plant life. The remedy is to create a moist atmosphere by moistening under the staging, and syringing the walls, then to fumigate with nicotine.

The Greenhouse and the Vegetable Garden.

Earlier supplies of Cabbage, Cauliflowers and Lettuce can be obtained by sowing seed in mid-January, either in a cold or heated greenhouse. Sow very thinly in boxes and prick off as soon as large

enough to handle. A slightly deeper box should be used than the one advised for annuals. As soon as the seedlings show signs of new growth they should be placed in a cold frame, the light being removed each day, except during very wet or frosty weather. The plants should be ready for planting out in the open about mid-April. These will give crops much in advance of those from seed sown in the open ground in March.

Mint.—Lift a few roots in November, and plant in a box, just covering the roots with soil. This will give an early supply about the end of March.

Parsley.—Lift plants from the open ground in December or January. These can be either potted up or planted in boxes, and will give an early supply before the outdoor crop is fit. It is also an advantage to make a sowing of Parsley in early March, prick off in boxes, and plant out when plants are well established. This crop will be ready much in advance of seed sown in the open.

A Few Hints.

During damp and foggy weather, if the greenhouse should strike unduly moist and damp, place a few lumps of unslaked lime about. This will absorb the moisture and sweeten the air.

Never apply fertilizers to freshly potted plants. Always see that the soil is moist before applying. Do not use more than is specified in the directions for use, and do not use too frequently.

In conclusion, avoid overcrowding your greenhouse, and confine yourself to subjects that require similar conditions.

The person who in a small greenhouse tries to grow a Climbing Rose, a Grape Vine, a few Tomatos, with ferns and general plants, is almost sure to fail.

The list of plants I have given in my talk only touches the fringe of the possible selection. My advice, however, is to confine yourself to two or three kinds of plants and to do them well.

The rudimentary legs (Le) and rostral apparatus or stylets (S) are distinct. The operculum (O) is large, while the lingula (L) is small and scarcely projects beyond the operculum.

Size (August measurements)	average	maximum	minimum
Length . . .	1.246 mm.	1.302 mm.	1.196 mm.
Breadth . . .	0.903 mm.	0.966 mm.	0.840 mm.

The *Adult* has also been described by LAING (*loc. cit.*). The general colour is that which prevails in the family—that is, a yellow body and two pairs of large, unspotted, mealy wings. The compound eye is undivided by a bridge formed of two lenses (DESHPANDE *). The 3-jointed rostrum or sucking-organ is rather broad and blunt-ended. The male (♂) is similar to the female (♀) except that it is smaller (fig. 76, 12).

Size (July measurements)	average	maximum	minimum
Length of body—male	1.17 mm.	1.22 mm.	1.15 mm.
female	1.26 mm.	1.41 mm.	1.19 mm.
Wing expanse—male	2.21 mm.	2.42 mm.	2.10 mm.
female	2.74 mm.	2.80 mm.	2.48 mm.

LIFE HISTORY.

The adult White Flies are gregarious and swarm on the lower surface of the topmost (distal) leaves from mid-June to mid-July (fig. 77, below). Their behaviour suggests that they are negatively geotropic, for they tend to congregate, to feed and to oviposit on the topmost leaves of the bush. The fact that they prefer the undersides of the leaves would suggest also that they are negatively phototropic, but this is discountenanced by HARGREAVES,† who gives the probable reasons for the fact that all stages of Aleurodids are generally found on the lower surface of the foliage. The experiments carried out by this investigator appear to show that the adults are neither positively nor negatively phototropic. The situation of the several stages of White Fly on the undersides of the leaves is considered to be correlated with the dorsal position of the anus. If, for instance, the insect lived on the upper surface of the leaf, not only would it be unable to get rid of its excreta, which would clog the anus and eventually occlude the spiracles, but the presence of honeydew—a suitable medium for the growth of fungi—on the upper surface of the leaf would stifle the larvae, the newly hatched larva would become entangled in the viscous excreta which fouled the leaf and it would be unable to settle down, while, when moulting, it would have difficulty in casting off its old skin.

The adults seldom fly except when the bush is shaken, when they fly up, but speedily resettle. They are very inactive during dull and

* Trans. R. Entomological Soc., London, 1933, vol. lxxxi, pp. 117–132.

† Annals of Applied Biology, 1915, vol. i, Nos. 3 and 4, pp. 330–331.

cloudy weather. The male and female white flies remain together during the period of feeding and oviposition (fig. 76, 11, 12), and the sexes occur in approximately equal numbers, with a slight bias in favour of females.

The eggs are laid scattered over the leaf-surface (figs. 75, 2, 76, 8), and are deposited standing up on a short stalk which serves partly as an attachment for the egg. The number of eggs laid by a single female varies, but individuals have been observed to deposit seven a day. This is borne out by the number of mature eggs observed in the ovaries, and egg laying occurs over a considerable period.

The period of incubation is dependent on climatic conditions, and varies from eight to fifteen days.

The eggs of Psocids—insects which are allied to the so-called Book-lice—occur with some frequency on the leaves of Rhododendrons, and have been mistaken by some for the eggs of the Rhododendron White Fly. They may be distinguished from those of the Aleurodid by the fact that they are laid in small clusters and are covered with fine silken threads (fig. 76, 9). The Psocids which hatch from these eggs feed on algae, lichens and fungi and are, therefore, harmless to the plant.

The White Fly larva on hatching is an active creature and capable of walking about on the leaf-surface, but it soon settles down to a sedentary life and commences to feed by means of its stylets, which are pushed into the leaf tissues. The effect of this abstraction of cell sap is to give rise to a considerable amount of yellow mottling, which is similar to that produced by the Rhododendron Bug, *Stephanitis rhododendri* Horv., except that the lower surface of leaves infested by White Fly do not show any rusty markings.

An excessive amount of honeydew is excreted which drenches the upper surfaces of the lower leaves and provides a matrix for the growth of Sooty Moulds (fig. 77, above), the presence of which hinders the normal functions—assimilation and respiration—of the leaves.

The larvae undergo four instars between August and April—the fourth instar being the pupal stage which is found in May.

The adults emerge from the pupa-cases through a T-shaped opening in the thoracic region.

The period of emergence of the adults is dependent on temperature—the following Table giving the dates of emergence over a period of six years.

TABLE I.

1928	June 26	Ascot
1930	June 20	Woodham
1931	July 5	„
1932	June 15	„
1933	June 7	„
1934	June 6	„

The accompanying graph (fig. 78, 15A) indicates the effect of temperature and sunlight on the emergence of adult White Flies during the years 1931 and 1933. A difference of four weeks in the emergence period occurred in these years, the lower temperatures prevailing during the spring and summer months, together with less sunshine, having the effect of retarding the later stages of the life cycle.

The period of egg-laying may also be protracted, *e.g.* the period of oviposition during 1932 in two gardens, viz. Woodham (Surrey) and Ringwood (Hants) was June 15 and July 11 respectively.

Table II shows the periods during which the several stages have been found to occur at Woodham (Surrey) (fig. 78, 15B).

TABLE II.

	<i>Earliest.</i>	<i>Latest.</i>
Egg	mid-June	early August
Larval period I	mid-July	mid-September
" " II	early September	mid-January
" " III	early January	mid-May
Pupal period IV	mid-April	mid-September
Adult	early June	late July

The species is single-brooded so far as our observations show. At one time we thought it possible that there may be a second brood owing to the presence of pupae on leaves in mid-September. It has been found that a few pupae may be present at this period and that some adults may emerge as late as mid-September, but there is no proof of a second brood.

HOST PLANTS.

The only plant upon which eggs have been found is *Rhododendron*.

The *Rhododendron* White Fly is partial only to smooth-leaved species and hybrids for the purposes of feeding and oviposition. While adult flies have been found at rest on the leaves of *Rhododendrons* whose foliage is provided with a dense tomentum, and on other plants, *e.g.* *Gaultheria*, *Kalmia*, *Pieris*, etc., growing in close proximity to infested *Rhododendrons*, no instance of feeding or of oviposition on such plants has been observed.

The factor of resistance to attack in *Rhododendrons* is apparently a physical one depending on the presence of hairs (tomentum), or scales, and the thickness of the epidermal layer.

The physical factors present in the following series of *Rhododendrons* are such that the plants are distasteful to White Fly.

	<i>Series</i>	
1. Presence of dense tomentum	Auriculatum	Falconeri
	Campanulatum	Grande
2. Presence of scales	Dauricum	Lepidotum
	Ferrugineum	Maddeni
	Glaucum	Triflorum
	Lapponicum	

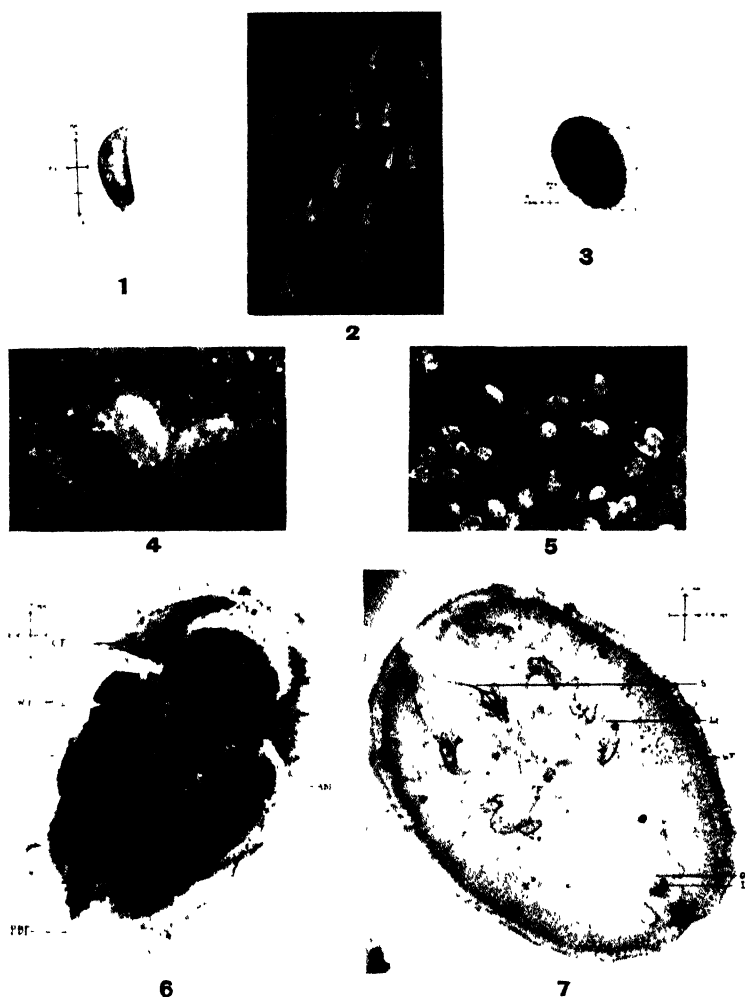
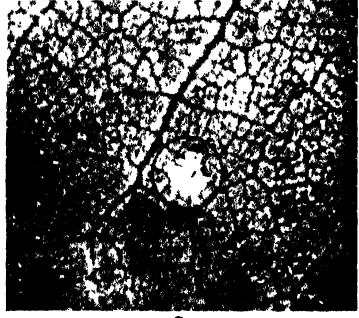


FIG. 75 - RHODODENDRON WHITE FLY

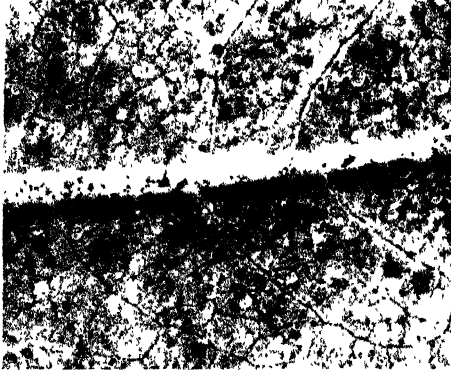
1 Egg, enlarged 2 Eggs *in situ* on leaf 3 Second-stage larva 4 Pupae on leaf one on right parasitized by *Lucania* 5 Pupa-cases on old leaf 6 Pupa, greatly magnified 7 Pupa-case, greatly magnified



8



9



10



11



12

FIG. 70. RHODODENDRON WHITE FLY

8. Eggs scattered over leaf surface. 9. Eggs of White Fly, together with egg-mass (ringed) of a Psocid. 10. Pupa cases on leaf. 11. Adults ovipositing on leaf. 12. Adults (♂ and ♀) ovipositing on leaf.

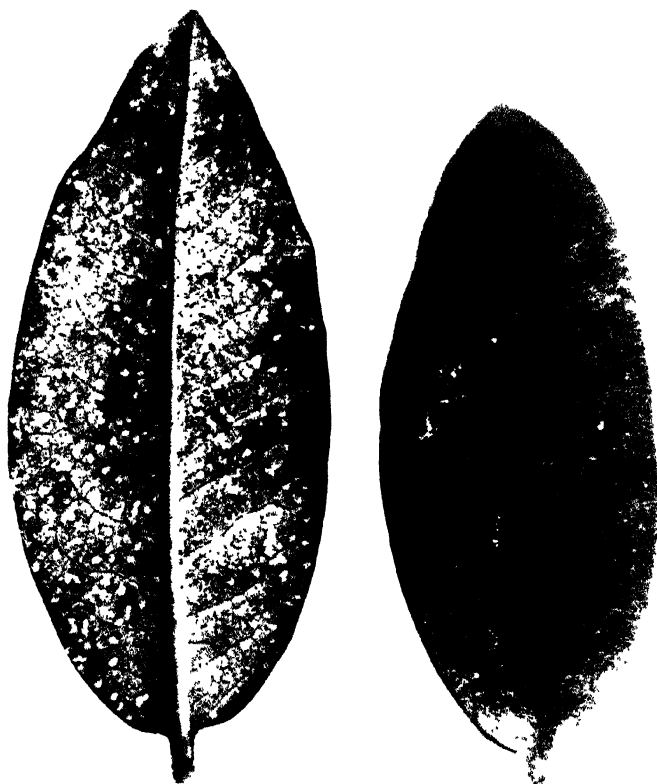
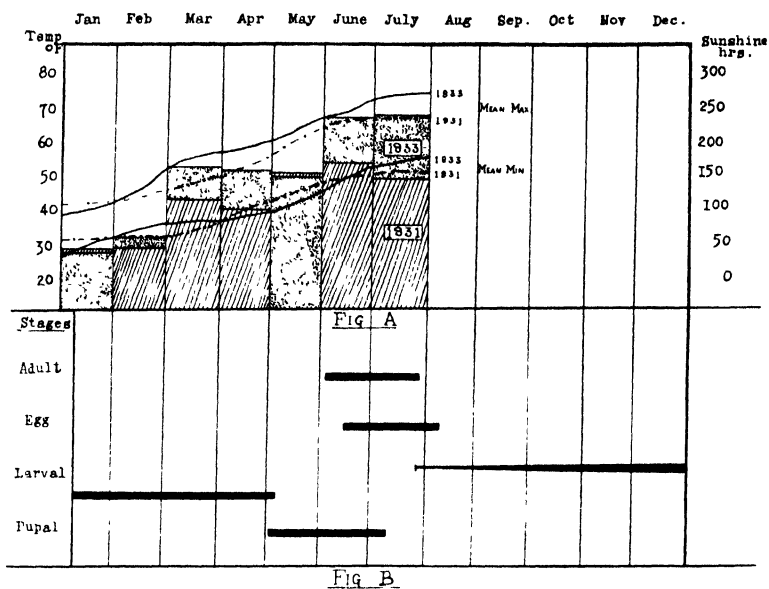
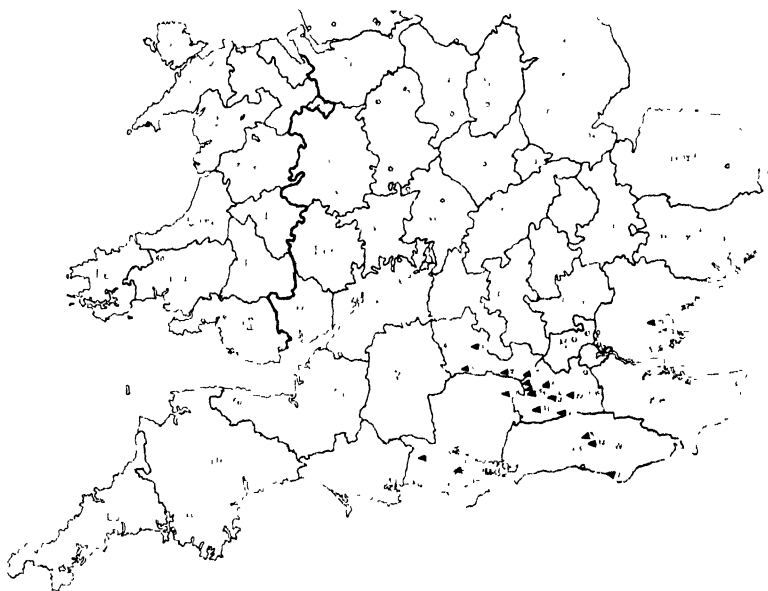


FIG. 77

Above Pupa cases on lower surface, sooty moulds on upper surface of *Rhododendron* leaf
Below New growths of *Rhododendron* var. 'Sigmund Rucker,' chosen by adults for feeding and oviposition



15



16

FIG. 78 -- RHODODENDRON WHITE FLY

15 A -- Effect of climatic factors on emergence period of the Rhododendron White Fly

B -- Months during which the several stages occur.

16 Map showing distribution of the Rhododendron White Fly

[To face p. 269]

	Series
3. Thickness of cuticle (leathery leaves)	Fortunei Thomsonii Lacteam
4. Thickness of cuticle and presence of tomentum	Taliense

The following list of *Rhododendrons*—species and hybrids—indicates those which are particularly susceptible to attack by the *Rhododendron White Fly*.

Series ' Ponticum '—*catalawbiense* and its hybrids.
caucasicum and its hybrids, more especially
pictum.
ponticum and its hybrids.
Smirnowi.

<i>Hybrids</i> —Cleopatra	John Waterer
C. S. Sargent	Mrs. E. C. Stirling
Cynthia	Mrs. R. C. Holford
Dairy Maid	Mrs. W. Agnew
Doncaster	Pink Pearl
Goldsworth Yellow	Purple Splendour
Handsworth White	Sigismund Rucker
Jacksoni	

DISTRIBUTION.

The distribution of the *Rhododendron White Fly* is at present confined mainly to the Home Counties and to the south of England.

The accompanying map (fig. 78, 16) indicates the years (28 = 1928) in which the first records were made of infestations of *White Fly* on *Rhododendron*.

County Records.

Berkshire	4	Kent	1 (1934)
Dorset (1934)	1	Surrey	8
Essex	1	Sussex	3
Hampshire	3		

It is hoped that the range over which the pest occurs will be restricted and not widened as was the case of the *Rhododendron Bug*, which has been dispersed over the greater part of the country on plants sent from infested areas.

Two instances may be quoted to show that this pest already has been unwittingly dispersed, viz.: (1) Essex outbreak (1929)—the infested plants were received from Berkshire in 1928; and (2) United States of America—the receipt of two consignments of infested plants at Washington, D.C., from England during 1931 and 1932 (*U.S. Dept. of Agric., Plant Quarantine and Control Administration, List of Intercepted Plant Pests*, March 1932, p. 252, and December 1932, p. 195).

Surveys have been made from time to time of plantations of *Rhododendrons* naturalized on heaths and in woods in the counties of Surrey and Hampshire, but no sign of attack by *White Fly* has been discovered.

NATURAL ENEMIES.

The Rhododendron White Fly is particularly free from attack by natural enemies—fungal organisms, birds, and parasitic and predaceous insects.

A comparatively small number of adult White Flies are caught in the webs of spiders, but their general freedom from enemies is marked.

The parasite of the Greenhouse White Fly, *Encarsia formosa* Gahan, has been found to parasitize the pupae of the Rhododendron White Fly (fig. 75, 4), but the factors which counter its successful employment in the open are: (i) the low night temperatures which prevail during the months of April, May and early June; and (ii) the somewhat prolonged life cycle of the parasite, which, according to SPREYER,* occupies at least twenty-eight days—this factor must be considered in relation to the first, the probability of climatic conditions favourable to the parasites during this period being somewhat remote.

CONTROL MEASURES.

The danger of this pest increasing to a degree comparable to that of the Greenhouse White Fly makes it desirable for growers of Rhododendrons to keep a careful watch on their plants and to take immediate and drastic steps against an infestation.

An early infestation is noted by (i) the presence of mottled leaves; (ii) the presence of pupa-cases on the leaves (fig. 77); and (iii) blackened foliage due to Sooty Moulds, which grow on the honeydew which falls from the undersides of the younger leaves on to the upper surface of the older leaves (fig. 77). Honeydew produced by other insects may of course drop on Rhododendron foliage from overhanging trees.

It is desirable to examine the foliage of all smooth-leaved species and hybrids prior to planting, particularly those plants which have been received from an infested district.

At the first sign of attack the larval-infested leaves should be handpicked and burnt. The time to remove such leaves is from September to April. It is unnecessary to remove the older leaves, on which only pupa-cases will be found.

The most satisfactory method of controlling this pest in plantations and shrubberies and on isolated specimen plants is to spray forcibly and thoroughly the undersides of the leaves with a white oil and nicotine emulsion. The formula which has been found to give a satisfactory control is:

White oil emulsion	.	.	1½ pint.
Nicotine, 96 per cent.	.	.	¾ fluid ounce.
Water	.	.	10 gallons.

Washes containing nicotine alone and Derris were found to be less effective against the larval stages. The presence of a highly refined

* Bull. Entomological Research, 1927, vol. xvii, pp. 301-308.

mineral oil increases the toxicity of the nicotine owing to increased wetting of the leaf surface and the creeping effect due to the oil so that the flattened larvae are thoroughly wetted by the wash.

The pressure at which the wash is applied is important, and at least 90 lb. to the square inch is desirable. This pressure may be readily attained by using a pneumatic knapsack sprayer.

The best time to apply this wash is in September and early October, though it may be applied as late as May. It is desirable, however, to apply the wash in autumn, for the young larvae are more readily killed than the older larvae and pupae.

Spraying should be carried out during dull weather, for some species of *Rhododendrons* are particularly susceptible to spray injury, and spotting of the foliage will result if the application is made on bright days. The correct procedure in spraying is to make an upward sweeping motion of the spray-nozzle to allow as much of the wash as possible to reach the lower surface of the leaves.

The adult White Flies may be readily destroyed when they are congregating on the young growths by dusting with a nicotine dust. Two or three applications of the dust over a period of three weeks is necessary owing to the extended period of emergence of the adults. The period over which dusting is effectual is early June to mid-July.

It may be necessary in large plantations and shrubberies to prune drastically and to burn the branches bearing infested leaves. This operation should be carried out during early spring so that the dormant buds will break, and so ensure that new growth is completed before the frost can injure it and to reduce the period when the bushes are unsightly owing to the removal of the growths.

Young plants prior to their dispatch from infested gardens and nurseries should have their leaves dipped in a white oil and nicotine emulsion or in a reliable tar-distillate wash at 5 per cent. concentration. This treatment when carried out during the dormant season will not injure the plants. To ensure perfect safety following the treatment the plants may be immersed in clear water a few hours after treatment with tar-distillate wash.

The application of a tar-distillate wash at 5 per cent. concentration to large plants in shrubberies has frequently proved effective. The smooth leaves of many hybrid *Rhododendrons* are not injured by this wash, which should be applied during the period December to February. It is essential, however, to direct the wash to the undersides of the foliage.

ACKNOWLEDGMENTS.

My sincere thanks are proffered to Mr. G. H. MAITLAND KING (Woodham) for affording me every facility for investigating outbreaks in his garden; to Mr. F. LAING, M.A. (British Museum, Natural History), for information concerning many aspects of the work in progress; and to Mr. F. C. BROWN (Wisley) for the large number of photographs which he has from time to time most willingly taken.

PLANTS TO WHICH AWARDS HAVE BEEN MADE, 1935.

Brassolaellocattleya × 'Empire.' A.M. April 24, 1935. A pleasing flower with light blush-pink sepals and petals, and a rich purple labellum, which has a fringed margin of lighter colour. *B.-l.-c.* × 'Caligula' × *C.* × 'Heatherwood.' Shown by N. Prinsep, Esq., The Boxes, Pevensey, Sussex.

Cymbidium × **Pauwelsii**, **Brockhurst** var. A.M. April 16, 1935. From F. J. Hanbury, Esq., East Grinstead. Produced by crossing *C. insigne* with *C. Lowianum* var. *concolor*. The spike carried 16 flowers of a pleasing bright apple-green, the median lobe of the labellum having a yellow apex.

Erythronium californicum. A.M. April 16, 1935. From Lt.-Col. L. C. R. Messel, O.B.E., Handcross. A handsome flowering plant for the herbaceous border and woodland. The glossy, silvery-green leaves are ovate-lanceolate, nearly a foot long. The flowers are borne singly or two or three together on slender scapes 18 inches high. The perianth-segments are narrow-lanceolate, white flushed externally with rose, spreading with somewhat recurved tips.

Iris Grant-Duffii var. **melanosticta**. A.M. April 16, 1935. From Messrs. Barr, Taplow. A variety of *Iris Grant-Duffii* from the type of which it differs by the presence of scattered black markings on the blade of the falls; the standards are pale sulphur, the falls lemon spotted and blotched with black; somewhat scented; height 13 inches.

Malus Halliana. A.M. April 16, 1935. From Mr. W. Bates, Wokingham. An ornamental bush or small tree with narrowly ovate, crenate, leathery leaves and semi-double, rose-pink flowers in umbels of six to seven, succeeded by small brownish-red fruits.

Narcissus 'Crocus.' A.M. April 16, 1935, as a show flower. A trumpet variety (Division 1a) with flowers $4\frac{1}{2}$ inches in diameter borne on stout stems 23 inches long. The perianth segments were broad, overlapping and chrome-yellow. The trumpet, which was the length of the segments and reflexed at the mouth, was a shade deeper in colour. Raised by Mr. P. D. Williams and shown by Mr. J. L. Richardson, Waterford.

Narcissus 'Dinkle.' F.C.C. April 16, 1935, as a show flower. This neat Barrii variety (Division 3a), raised by Mr. F. Herbert Chapman, received A.M. as a variety for cutting on April 23, 1930 (see JOURNAL R.H.S. vol. 56, p. lii). Shown by Mr. R. F. Calvert.

Narcissus 'Effective.' A.M. April 16, 1935, as a show flower. A bicolor trumpet variety (Division 1c) with flowers $4\frac{1}{2}$ inches in diameter borne on stems 17 inches long. Perianth segments smooth, broad and overlapping, trumpet slightly longer than the segments and reflexed at the mouth, chrome-yellow, the colour suffusing the bases

of the sulphury white segments. Raised and shown by Mr. Guy L. Wilson, Broughshane.

***Narcissus 'Glorious.'** A.M. April 16, 1935, for garden decoration and for cutting from the open for market. Division 8. Foliage spreading, flat; stem 17 inches, carrying flowers in twos and threes, well posed; perianth $2\frac{1}{2}$ inches, segments overlapping; length 1 inch; width 1 inch. Corona width $\frac{1}{2}$ inch. Free-flowering. Average flowers from a bulb 7.9. White perianth with deep orange cup. Flowering from March 30 to April 13, 1935. Sent by Mr. J. L. Richardson.

Narcissus 'Golden Wedding.' A.M. April 16, 1935, as a show flower. Apparently a trumpet, but really an *Incomparabilis* variety (Division 2a) with clear-cut flowers $4\frac{1}{2}$ inches in diameter borne on 16-inch stems. The pale chrome-yellow perianth segments were smooth, broad and overlapping, but rather pointed. The trumpet, which was nearly as long as the segments and deeper in colour, widened slightly at the mouth. Raised and shown by Mr. Guy L. Wilson.

***Narcissus 'Grand Master.'** H.C. April 16, 1935, for garden decoration. Division 1a. Foliage erect, flat, stem 13 inches, carrying single flowers, well posed. Perianth $4\frac{1}{2}$ inches diameter; segments slightly overlapping. Length $1\frac{1}{2}$ inch, width $1\frac{1}{2}$ inch. Corona $1\frac{3}{4}$ inch deep. Fairly free-flowering. Average flowers to a bulb 4.4. Golden-yellow. April 17 to April 28, 1934, and March 26 to April 3, 1935. Sent by Messrs. Tyler, Southrepps, Norwich.

†**Narcissus 'Ian Secrett.'** A.M. April 16, 1935, for cutting from the open for market. Division 9. Vigorous. Stem 17 inches, medium thickness. Flower well posed. Perianth $2\frac{1}{2}$ inches diameter. Segments flat, overlapping for two-thirds their length, regular, blunt, creamy-white. Corona $\frac{1}{2}$ inch deep, $\frac{3}{4}$ inch wide, expanded, ribbed, flat, margin crenate, orange. Bulb medium sized. Very free-flowering. March 24 to April 20, 1933, and April 3 to May 1, 1934. Sent by Mr. F. A. Secrett, Walton-on-Thames.

***Narcissus 'Outrider.'** H.C. April 16, 1935, for garden decoration. Division 1a. Foliage erect, flat, stem 13 inches, carrying single flowers, well posed. Perianth $4\frac{1}{2}$ inches diameter; segments slightly overlapping; length $1\frac{3}{4}$ inch, width $1\frac{1}{2}$ inch. Corona $1\frac{1}{2}$ inch deep. Fairly free-flowering. Average flowers from a bulb 4.4. Golden-yellow. April 12 to April 28, 1934, and March 8 to April 8, 1935. Sent by Mr. F. A. Secrett.

Narcissus 'Pera.' F.C.C. April 16, 1935, as a show flower. This bicolor *Barrii* variety (Division 3b), raised by the Brodie of Brodie, received A.M. as a show flower on April 21, 1931 (see JOURNAL R.H.S. vol. 57, p. xlv). Shown by Mr. R. F. Calvert.

Narcissus 'Principal.' A.M. April 16, 1935, as a show flower. A trumpet variety (Division 1a) with flowers about 4 inches in diameter borne on stems 19 inches long. The perianth segments were broad and overlapping. The cylindrical trumpet, which was reflexed at the

* Award after trial at Kirton.

† Award after trial at Gulval.

margin, was longer than the segments. The colour was chrome-yellow, almost self, but the trumpet was of a slightly deeper shade. Raised and shown by Mr. Guy L. Wilson.

***Narcissus 'Queen of the North.'** A.M. April 16, 1935, for garden decoration. Division 4b. Foliage erect, flat; stem 17 inches, carrying single flowers; perianth 3 inches diameter, segments slightly overlapping, length $1\frac{1}{2}$ inch, width 1 inch. Corona $\frac{1}{2}$ inch deep. Very free-flowering. Average flowers from a bulb 10.7. Creamy-white perianth, pale yellow corona. Flowering from March 23 to April 10, 1935. Sent by Messrs. R. H. Bath, Wisbech.

Narcissus 'Slemish.' A.M. April 16, 1935, as a show flower. A beautiful white trumpet variety (Division 1b) with flowers over $4\frac{1}{2}$ inches in diameter borne on 19-inch stems. The smooth, very broad, overlapping, greenish-white perianth segments were slightly reflexed and the milk-white trumpet was frilled at the margin. Raised and shown by Mr. Guy L. Wilson.

Odontioda \times 'Thora.' A.M. April 16, 1935. From Messrs. McBean, Cooksbridge. The result of crossing *Odontioda* \times 'Ben Hur' with *Odontoglossum* \times 'Omega.' The spike bore 3 large flowers of crimson-purple colour.

Odontoglossum \times 'Alector' var. 'Monaco.' F.C.C. March 19, 1935. From M. L. Wells, Esq. (*O.* \times 'Amabilicity' \times *O. crispum*.) Spike of 7 large white flowers with round segments, each of which bears a conspicuous reddish blotch.

Odontoglossum crispum var. 'Celia Nellson.' F.C.C. April 2, 1935. From N. Prinsep, Esq. An unusually fine form of this well-known species. Spike of five large flowers with broad segments, which are white tinged with rose-violet on the margin.

Primula Rockii. A.M. April 16, 1935. From the Director, R.H.S. Gardens, Wisley. A pretty, tufted, Chinese species, perfectly hardy but well worth a prominent place in the alpine house. The long-stalked leaves have ovate blades $\frac{3}{4}$ inch long, undulate and doubly serrate with rounded teeth. The rich yellow, fimbriate flowers are carried in stalked umbels of two to four.

Prunus subhirtella flore pleno. A.M. April 16, 1935. From Collingwood Ingram, Esq., Benenden. *Prunus subhirtella* is a beautiful small-flowered Japanese Cherry, of which several forms, some erect, some pendulous, are in cultivation. The present variety is of the latter group, and has numerous deep pink semi-double flowers.

Rhododendron 'Adelaide.' A.M. April 24, 1935, as a hardy flowering plant for general garden use. Shown by Lionel de Rothschild, Esq., Exbury, Hants. *R.* \times 'Aurora' \times *R. Thomsonii*. Raised by the exhibitor. Leaves grouped at the end of the branch below the flowers; blades oval, rounded at base and apex, 8.5-11 cm. long, 5-6.5 cm. wide, green above, glaucous below; petioles stout, up to 3 cm. long. Flowers about 12 in a well-formed flat-topped truss which is about 15 cm. in diameter; pedicels stout, 3 cm. long, light

* Award after trial at Kirton.

green flushed red above ; calyx about 1.2 cm. long, lobes rounded, pale greenish ; corollas funnel-shaped with wide spread lobes at length reflexed, about 5 cm. long and 8-9 cm. across, fleshy, scarlet and faintly primrose with five dark nectar pouches at base and lightly spotted at the back of the tube within ; stamens unequal, filaments white flushed pink, exceeded by the style.

Rhododendron 'Alcesta.' A.M. April 24, 1935, as a hardy flowering plant for general garden use. From Lord Aberconway, Bodnant, N. Wales. *R. burmanicum* \times *R. lutescens*. Raised by the exhibitor. Leaves loosely disposed, elliptic, acute, base cuneate, bright green above, paler below, lepidote on both surfaces, from about 6 cm. long and 2.5 cm. wide to 9 cm. long and 4.8 cm. wide, of thin texture. Flowers about 6 at the ends of the branches, produced from 2 or 3 buds, each bud giving rise to 2 or 3 flowers ; pedicels about 2 cm. long ; corollas funnel-shaped, lobes spreading, up to 3.5 cm. long and 6 cm. across, pale creamy-yellow with a darker yellow blotch at the back of the tube within ; filaments and style whitish yellow.

Rhododendron 'Cornish Cross,' Exbury var. A.M. April 16, 1935. From Lionel de Rothschild, Esq., Exbury, Hants. This fine hybrid was raised at Exbury by crossing *R. Griffithianum* and *R. Thomsonii*, a cross first made by Mr. S. Smith several years ago. Leaf blades large, flat, glabrous, oval-oblong, obtuse, cordate, 12-14 cm. long, 6-8 cm. wide, dull green above, paler to almost glaucous below ; petioles 3-4.5 cm. long. Inflorescence a loose truss of 10 to 12 flowers with funnel-shaped corollas, which are 5-6 cm. long, 8-9 cm. across, uniform crimson with a soft bloom outside and small dark nectar pouches at the base within, the spreading semi-orbicular lobes about 3 cm. long and 4.5 cm. wide ; pedicels glabrous, 3-3.5 cm. long.

Rhododendron Lindleyi. A.M. April 24, 1935, as a flowering shrub for the cold greenhouse. From Lionel de Rothschild, Esq. (K.W. 8546). Leaves with blades oblong-ob lanceolate acute, cuneate at the base, 10-13 cm. long, 3-5 cm. wide, dull dark green and rugose above, glaucous and scaly below ; petioles stout, 3 cm. long. Flowers six in a loose head, borne on very stout green and white scaly pedicels which are about 3 cm. long. Calyx green, about 3 cm. long, deeply divided into five oblong lobes which are rounded and ciliate at the apex. Corolla tubular, funnel-shaped, somewhat compressed laterally, with the lobes at length rather reflexed, about 9.5 cm. long and 10.5 cm. wide, white delicately flushed rose-magenta outside especially towards the apex of the lobes, yellow at the base within. Filaments cream-coloured, not exceeding the corolla-tube. Style green, exserted.

Rhododendron 'Portia.' A.M. April 24, 1935, as a hardy flowering plant for general garden use. From Lord Aberconway. *R. strigillosum* \times *R. euchaetes*. Branches and the stout petioles prominently barbate. Leaves oblanceolate, short acuminate, 10-18 cm. long, about 4.5 cm. wide, base rounded, leathery, dark green and rugulose above, pale

green below. Flowers in a compact flat-topped truss which is about 12 cm. in diameter; corollas about 4 cm. long and 4.5 cm. across, fleshy, bright, dark crimson-scarlet with prominent dark nectaries at the base, faintly spotted at the back within; stamens unequal, like the style, white tinged pink; calyces crimson, white pubescent like the pedicels.

Rhododendron × '**Thomwilliams,**' Bodnant form. A.M. April 24, 1935, as a hardy flowering shrub for rock garden or general garden use. From Lord Aberconway. Leaves with petioles 1.5-2.3 cm. long, blades suborbicular, base cordate, up to 6.5 cm. long and 5.5 cm. wide, glabrous, green above, glaucous below. Flowers about 6 in an open truss, on long pale green pedicels; corollas funnel-shaped with lobes somewhat reflexed, about 4 cm. long and 8 cm. across, clear waxy rose-magenta; stamens unequal, filaments white flushed rose, exceeded by the style.

Schizanthus '**Bath Giant Blotch Strain.**' H.C. April 8, 1935, after trial at Wisley. From Messrs. Blackmore & Langdon, Bath. Plants vigorous, of bushy habit, branching freely from the base; foliage sparse; flowers 1½ inch diameter, comprising shades of pink, carmine, purple and blush, each having a prominent darker blotch of the same colour, the usual venation on a yellow ground being eliminated. A good even stock.

Schizocodon soldanelloides ilicifolius albus. A.M. April 16, 1935. From Dr. Fred Stoker, Loughton. A hardy Japanese alpine plant suitable for the alpine house or rock garden. It forms a cluster of coarsely serrate, coriaceous, bronzy-green leaves. The flowers, which have white, finely fimbriate petals and pink-tinted calyces, are borne in terminal clusters on stalks 3 inches high.

Trifolium uniflorum, Millard's var. A.M. April 16, 1935. From F. W. Millard, Esq., Felbridge, East Grinstead. An attractive alpine plant from Asiatic Turkey, forming a rounded mat of light green, pinnate foliage, from the centre of which arise numerous pea-like flowers of crimson and white, on very short axillary stalks.

Tulipa lanata. A.M. April 16, 1935. A large-flowered Persian species, with blooms of cochineal red and a black base edged yellow. Imported and shown by Messrs. C. G. van Tubergen, Haarlem, Holland.



FIG 79 —*QUERCUS GARRYANA* IN BRITISH COLUMBIA.

[To face p. 276.



FIG. 80 - *ARBUTUS MENZIESII* IN BRITISH COLUMBIA.



FIG. 81.—*ERYTHRONIUM GRANDIFLORUM ALBIFLORUM*, OAK BAY, BRITISH COLUMBIA

[To face p. 277.

NOTES ON GARDEN PLANTS.

By J. C. BENNETT.

QUERCUS GARRYANA Dougl. (fig. 79).

Quercus Garryana (= *Q. Gilbertii* Green) is an oak which occurs in scattered localities along the Pacific Coast from British Columbia to California, apparently preferring an arid climate where it is not overpowered by the dense vegetation of the humid districts. It makes a round-headed tree fifty or sixty feet high in favourable situations, but there are all gradations in size to prostrate specimens which grow in shallow rock crevices. Professor PIPER says "*Quercus Gilbertii* is the low, often prostrate, oak occurring about the Gulf of Georgia and locally known as vine oak. It is remarkably variable in foliage, but no fruiting specimens have been found. In sheltered places it assumes the ordinary form of *Q. Garryana*." A curious statement which seems to show there was insufficient investigation into the habits of this tree, and no foundation for the name *Q. Gilbertii*.

The photograph shows a normal tree and one which for some reason, perhaps connected with nutrition, has assumed a curious, though not exceptional, form. *Camassia Leichtlinii* is growing in the foreground.

Q. Garryana presents one of the adaptations by which many plants survive periodical bush fires, in that death of the aerial portions causes the root-crown to develop into a woody platform just below the surface of the ground, and from this platform arise several permanent stems to replace the original single trunk. Sometimes this platform will partly surround a rock weighing a hundredweight or more and hold the rock suspended when the soil beneath has been washed away by rains.

The wood is hard but not durable and has little use except as fuel.

ARBUTUS MENZIESII Pursh. (fig. 80).

This beautiful tree is too well known in England to need any description here. However, it has requirements which do not seem to be always understood, so perhaps these few notes may have some value.

Arbutus Menziesii is a Californian tree which has ranged along the Pacific Coast to its northern limit of hardiness just over the Canadian border. It is capable of standing temperatures slightly below zero, but is partially defoliated by the blizzards which occur there in severe winters. The tree prefers poor gravelly soils and hot dry slopes and seems to reach its greatest development not very far from the sea. The finest specimens I have seen were growing in thin light soil over bedrock with branches almost touching the water of a quiet bay, and which in the autumn presented a cascade of crimson berries in such quantity that the foliage was nearly hidden. It is obvious that a tree

with these requirements in the wild state will, in a comparatively rich moist soil, make soft late growth which is unlikely to produce much fruit.

Wild plants are always uncertain even when transplanted in little more than the seedling stage, but I do not know if this applies to nursery grown stock. Undoubtedly the best way to propagate this tree is from seeds, which germinate freely in the following spring if sown as soon as ripe. The seedlings should be grown on in pots until large enough to plant out, care being taken not to damage or distort the taproot.

The photograph (fig. 80) shows two specimens of this tree on Cape Saxe, British Columbia, that in the foreground 75 feet high, girth 9 feet 8 inches; the other 83 feet high, girth 11 feet. These dimensions are not unusual, a height of 125 feet and corresponding increase in girth being recorded in California. On the right are *Spiraea discolor* and *Abies grandis*, the latter showing damage to the top by wind; on the left stunted Douglas firs.

ERYTHRONIUM GRANDIFLORUM VAR. ALBIFLORUM Hook. (fig. 81).

This beautiful variety of *E. grandiflorum*, called *E. giganteum* by LINDLEY, is found west of the coast mountains in southern British Columbia and as far south as Oregon. It does not seem to occur far from the coast and is probably at its best at the south-east end of Vancouver Island where it is associated with many plants adapted to the parched summer condition and thin light soil overlying gravel of that district.

The photograph (fig. 81) shows the variety under natural conditions, but on private property fenced for many years against the plant's two worst enemies—cattle and children. Whether or not it was as plentiful in the early days of British Columbia I do not know, but at present it is only fairly common and shows signs of disappearing as settlement extends.

E. grandiflorum albiflorum has large pure white flowers, tinged with yellow and marked with brown at the base, and leaves strongly mottled brown. As a rule the twelve-inch stem carries only one flower, but two or three is not uncommon, and I have heard of a seven-flowered specimen. Although this plant reaches its greatest development in light shade it succeeds quite well in full sun and is capable of competing with the strong grasses which quickly establish themselves when the land is cleared of trees and brush. The corms are difficult to collect in any quantity owing to the depth at which they are to be found and the stony nature of the soil the plant prefers.

Further north this variety is replaced by *E. grandiflorum* var. *Smithii* (Hook.) which has slightly smaller pink flowers but similar habits and appearance. Var. *Smithii* is supposed to be related to the Californian *E. revolutum*, but the gap of more than five hundred miles between the habitats of the two plants is difficult to explain and the tendency now is to raise var. *Smithii* to specific rank.

E. grandiflorum albiflorum is one of the easiest of the Erythroniums to manage under cultivation, but is inclined to suffer seriously from the tulip fire disease if its constitution is upset by unsuitable conditions. It appreciates better soil but still requires the thorough summer ripening after the leaves have died down in June. Seeds sown as soon as ripe germinate freely the following spring, and it is advisable to sow them thinly in outside nursery rows so that the seedlings can be left undisturbed during the first two or three seasons. The corms should reach maturity in about five years, though a few will flower earlier. Careful handling is necessary because the corms are easily killed if dried and so should be kept in slightly moist soil if they are not planted immediately. They are also very brittle, though when broken the pieces will grow and flower within a few years.

CORRECTION : The name of the yellow Erythronium referred to in an article of mine in vol. 59, p. 348, 1934, of the JOURNAL should be *E. grandiflorum* var. *parviflorum* and not *E. g. Smithii* as stated.

BOOK REVIEWS.

"Gertrude Jekyll: A Memoir." By Francis Jekyll. 8vo. 248 pp. (Cape, London, 1935.) 10s. 6d.

To the younger gardeners of these days the figure of Gertrude Jekyll had much of the quality and remoteness of a legend. Increasingly few were those who had met her face to face, and tidings of her existence seemed rather to come from the distant pages of history than from contemporary sources.

Gardeners of to-day, and those older ones who were her friends, will therefore welcome Mr. Francis Jekyll's timely and admirable memoir of his aunt, to which Lady Jekyll and Sir Edwin Lutyens contribute gracious and illuminating introductions.

Gertrude Jekyll was fortunate both in her upbringing and in her day, a time when art under the compelling authority of Ruskin and Morris was in the foreground of English culture. From Morris she learned that handicraft might become almost a religion; from Ruskin the delight in the smallest detail of Nature's most wayward fancies; and from the Pre-Raphaelites and her friend, Henry Brabazon, the gospel of colour.

Her ardent and vigorous spirit, released among such surroundings, flew butterfly-like from one interest to another. Metal work, textiles, wood and paint assumed under her untiring fingers notable and varied forms, and any observing friend, watching these darting flights, must have wondered if any settled purpose would follow. Fate had, however, marked her out and stepping in at the right moment produced a young architect, named Lutyens, who gave her the needed scope and direction. From that time the garden claimed her main gifts and to it she brought the artist's trained eye and a fresh and independent mind. Soon she was in the thick of the garden world. William Robinson, Dean Hole and G. F. Wilson were among her friends and advisers, and her own home and garden at Munstead Wood became the centre of her life and a source of inspiration to gardeners in many lands.

The keynote was set by the wood into which the garden seemed quite naturally to flow, and yet the wood remained natural. Munstead became a Mecca for gardeners and was almost as difficult of access. Gertrude Jekyll did not suffer visitors gladly: in fact, one did not "visit" Munstead Wood; one was presented. Once there the rituals had to be observed, no excited rush from flower to flower, you proceeded at the pace of the hostess. Sir Edwin Lutyens tells a harrowing tale of gathering a choice flower destined for seed; small wonder is it that it was the last flower he ever gathered, there or elsewhere. The writer, too, remembers an awful moment on a woodland path when he almost, but not quite, trod on a Chanterelle.

There is no need to speak here of the many books which bear Miss Jekyll's name, or of the gardens that bear her signature, they are gathered together for us in Mr. Jekyll's book.

We are grateful for many revelations of her habits and character which only a member of the family could give. Armigerous as she was there was no barrier between her and the village folk, whose works and days she so carefully studied. We are glad to hear that when occasion called she could release a pungent epithet.

A little sadly did old age come. Her eyesight, always weak, gradually failed, and the colour and form which were so much her life grew blurred and dim. Never, however, did her indomitable spirit give way. If she could no longer paint, why there were shells or leaves to be made into pictures, she could still plan and trace the lines of new gardens. And so, fighting to the end against disabilities which would have conquered many, passed this fine spirit who left on English gardens an indelible mark. In place of the restless lines and florid planting of the Victorians, she brought measure, balance, and restraint, and it is our good fortune to succeed to this inheritance.

"Ornamental Shrubs and Trees: their selection and pruning." By A. J. Sweet. 8vo. xiii + 64 pp. (Dent, London, 1935.) 5s. net.

Here we have a useful book dealing first with choice of shrubs for various seasons and purposes and secondly with pruning. The former part gives, as a rule, generic names only and a further guide is required where small gardens are

concerned, especially as little is said concerning the dimensions ultimately attained by the trees and shrubs mentioned. The latter part is more complete and gives just the information many seek. It is cheering to read, in so many instances, that this or that shrub is better left alone. We wish the advice given could be read and acted upon by all who have the charge of shrubs and trees, for there are still many whose one idea seems to be to go over the poor wretched things in autumn and clip them into shape—shape which nature never intended. Many of our railway stations are made unsightly by this kind of "care," and not they alone.

It is a pity the print is not larger, as it might well have been without greatly increasing the size of the book, but increasing the ease of consulting it.

"Mushroom Growing." By W. B. Ware, M.Sc. Bull. 34. Min. of Agric. Ed. 3. (H.M. Stationery Office, London, 1935.) 1s. 3d., paper covers.

The valuable account of mushroom-growing, first published in 1931 and since revised, has served as a guide to a large number of new growers and, a new edition being called for, the opportunity has been taken of adding new matter gleaned by the author's visit to America and to research workers dealing with mushroom-growing problems, and also a chapter on pests by Messrs. Jary and Austin. The bulletin can be recommended as a reliable and up-to-date guide, not minimizing the difficulties and the need for unremitting attention that the cultivation of the mushroom entails. A word or two is said about the cultivation of mushrooms in the field and a warning that profit is unlikely to be made from such attempts.

"The Botanist in Ireland." By Dr. R. L. Praeger. 8vo. 432 pp. (Hodges, Figgis, Dublin, 1934.) 12s. 6d.

The main object of this book is to enable visitors to Ireland to ascertain what plants are to be found in any locality. What plants of interest are near Lough Carra for instance? Turn to paragraph 372 (for the book is numbered in paragraphs for the most part) and there they are with notes on the topography and peculiarities of the district and upon the characteristic vegetation. As can be imagined this is a very useful book to the tourist and no one could have written it better either from the knowledge he has or from the pleasant fashion of imparting it.

Not only is the main purpose of the book carried out admirably but there is also a census of Irish plants, copious notes on the flora generally and on particular plants of special interest, an annotated list of botanists who have studied the Irish flora and a large number of clear figures and well reproduced photographic illustrations of characteristic plants. Excellent maps add to the value of the book. We have nothing like it for the flora of England, and perhaps it is as well, lest it should be used as an easy aid to the would-be raider who is, alas, not yet extinct.

"Garden Flowers in Colour: A Picture Cyclopaedia of Flowers." By G. A. Stevens. 8vo. 320 pp. (Macmillan, New York, 1934.) 16s. net.

A series of coloured illustrations of garden plants, most of which have appeared in plant catalogues, with brief notes on their habits and requirements. As a rule the "common name" is used and, in consequence, the identity of the plants is not always easily ascertained. On p. 15, for instance, we find the heading "Flowering Almond," a stupid name of course, and the picture shows a low shrub branched from the base and wreathed with double pink flowers—probably *Prunus triloba*. On p. 17 two species of *Alyssum* are pictured, but nothing in the text does more than hint by inference that one is *Alyssum maritimum*. The text is equally unhelpful to English gardeners in many places. We read, for instance (p. 14), that "there are several species of *Aethionema* . . . but they are all much alike and it makes little difference which one is planted." English gardeners know how the species differ in hardiness as well as in beauty.

The paper is heavy and the colouring, for the most part, crude. An exception to this may however be seen in the Roses pictured.

"Your Kitchen Garden." By Harry A. Day. 8vo. 163 pp. (Methuen, London, 1935.) 3s. 6d.

This book is written to help the average householder with garden ground to produce vegetables, salads and herbs. The author claims that it contains the essentials of good vegetable cultivation.

The early chapters deal with the layout of a small kitchen garden. Subsequent chapters concern the simple treatment of most vegetables, which are

grouped under leafy vegetables, leguminous vegetables, long-rooted vegetables, onions, stem vegetables, tuberous-rooted vegetables and vegetables under glass, including "vegetable fruits"—Cucumbers, Tomatos, Marrows and Aubergines. There is also a short chapter dealing with herbs. The author is able to mention all these within a few pages. This brief but adequate treatment is a valuable feature of the book as sound practical advice is given. There is a useful table to show the amount of seed required, the depth and date for sowing, and the necessary time required for development to maturity. Amongst the varieties recommended a large number are sold by *one* firm, and this detracts from the value of the book.

The book unfortunately contains some amazing statements: on p. 29, "One of the best preparations to use against all pests and diseases is Bordeaux mixture"—it is of no practical value whatsoever against insect pests. Advice given on p. 139 concerning the rubbing in of fresh slaked lime into the affected part of the plant is reminiscent of the blatant advertisements for proprietary ointments; the claims made for fresh lime are as extravagant.

"The Physick Garden: Medicinal Plants and their History." By Edith Grey Wheelwright. Demy 8vo. 288 pp. Illustrations 18. (Jonathan Cape, London, 1934.) 10s. 6d. Cloth.

After reading this book we are left with a feeling of disappointment; had the author confined herself to the subject, and avoided unnecessary excursions into the History of Civilization and such irrelevancies as bone disease in fossil vertebrates the book, we feel, would have approached the promise of its title. Miss Wheelwright takes us along that tortuous, often thorny, but slowly progressive path which has led from the use of primitive and rude medicaments to the complicated system of modern therapeutics. A path darkened by fear and superstition but, at rare intervals, illumined by the courage and understanding of a Galen, a Paré, or a Sydenham, and smoothed by the genius of Hippocrates, the impress of whose step still retains its pristine definition. The long list of our native medicinal plants, together with their reputed properties, will be of interest to herbalists and to the many who, without any qualification to express an opinion, "believe in natural remedies."

Considerable discrimination has been shown in selecting, for the purpose in hand, from the best of Herbal literature. Indeed, in our opinion, the portions of the book devoted to this subject give the work its greatest value.

Apart from diffusiveness, the faults in the book are due, we suspect, to a certain impetuosity, an impulse to "get on with it," and to a casual reading of the proofs. It is necessary, however, to notice certain errors, but in the hope that criticism may help, not damn. Beyond deflecting the reader's attention, mistakes in spelling are of little account unless they alter the actual meaning of words; the rendering of Vitamin B as the antineurotic (instead of antineuritic) factor comes under the latter category. From the learning displayed by the author, it is obvious that the phrase "Vegetable alkaloids such as aconite, nicotine and belladonna" is an accident; nevertheless, it occurs. So do the rather fatuous remarks that atropine "checks profuse sweating in intestinal colic" and that Tincture of Digitalis is employed as "a diuretic in cardiac and mitral disease." Would the statement "Sometimes the sugar content of a fruit will be more than 50 per cent. of the weight" not have gained in accuracy by the insertion of "dried" before fruit? And why, if it was necessary to mention the composition of Dover's Powder and Black Draught, is opium omitted in the first case, and Epsom Salts in the second? A moment's thought would have corrected the infelicitous expression "In pharmacy, most of the purgative drugs like aloes, senna, cascara and rhubarb are glucosides. The yield varies with the species and with the season of the year." Then, we suggest, a note might have been added to explain the cryptic "Bacteria performed the indispensable function of re-moulding the earth's crust."

Concerning the inception of the Pharmaceutical Society of Great Britain we are told that "The object of the Founders was to form a national institution for the advancement of pharmacy as distinct from the practice of medicine. It was realised that pharmacy embraced so many sciences and had become so much more complicated that in the public interest it demanded the exclusive attention of its members." Does not this convey that medicine, as a profession, had been a mere appurtenance to pharmacy? And one of minor consequence at that. The implication that Koch's discovery of the tubercle bacillus had any part in clearing the way for the monumental work of Joseph Lister should not have been admitted, and it is questionable whether such chemical technicalities as bornyl and acetic esters have a place in such a book as this.

F. STOKER.

"Bigger and Better Roses for Garden, House, and Exhibition." By G. F. Mappin. 8vo. 160 pp. (H. Jenkins, London, 1934.) Price 2s. 6d.

This is an unusual book, quite off the lines of the ordinary rose manual. It is divided into two parts. Part I deals with cultivation and Part II with exhibiting; the only form of exhibiting contemplated being that of single blooms set up in boxes or of roses (clearly of "exhibition" type) shown in baskets. The latter are all to be supported by and tied to wires. When will the N.R.S. be strong enough to forbid the use of wires, at least in their decorative classes? The carnation folk appear to have done it and with good results.

A book entirely devoted to the growing and treatment of roses for exhibition in boxes seems to take us back to the days of Foster-Melliar and Reynolds Hole, but doubtless, whatever view the public may take of their efforts, there will, for a long time to come, be many, especially among amateurs, to whom contests of this character will specially appeal. The exhibitor of roses in boxes can cut his flowers with short stalks so causing little or no injury to his plants, whereas when exhibiting in the decorative classes, the grower has generally to cut with much longer stalks, which may cause some serious check to the plant. Our author calls it a murderous business, and thinks that the tree may take a couple of years to recover.

Part I, which deals with cultivation contains much that must be regarded as still controversial. For instance our author considers that rose plants should always be procured from a nursery of poorer soil than that of the garden in which they are to be grown. This might often be difficult to arrange and does not seem proved with any certainty.

Again a long chapter is devoted to the evils of "underground feeding." Probably we were all taught the value of double trenching to a depth of two or three feet; Foster-Melliar advised adding the greater part of the manure to the upper part of the second spit, and many of us have doubtless to some extent revised our earlier efforts. Major Mappin, who uses a rather "green" or undecomposed compost, found it, as one might expect, deleterious to bury this too deeply, and no doubt he is right that green manure becomes sour if buried beyond the reach of the air, and should not be so employed, and he is quite safe in substituting rotten turves; but he probably states his proposition too broadly. The value of the celery trench in the general enrichment of the kitchen garden is well known.

In pruning the author would apparently substitute for the usual method of counting the number of buds to be left, a certain number of inches dependent on the variety. This seems rather a retrograde movement; moreover in considering the extent of pruning to be adopted regard must always be had to the extent of space in bed or border that the plant is to be at liberty to occupy.

Enough has been said to show that the book raises many questions of interest to rose growers, and Major Mappin has a trenchant method of putting his conclusions that calls for consideration.

The book seems solely confined to the writer's personal experience, which is its chief merit. In the chapter relating to diseases no mention is made of stem canker, now so prevalent (let us hope that the author's garden has escaped and may continue to do so). There is little or nothing about climbers, polyanthas, pompons or decorative roses, and no description or selection of varieties. Perhaps the worst fault is that there is no index.

H. DARLINGTON.

NOTES AND ABSTRACTS.

Plum Sawfly (*Hoplocampa flava* L.), On the Biology of the, with Notes on Control Experiments. By F. R. Petherbridge, I. Thomas and G. L. Hey (*Ann. App. Biol.*, 1933, vol. xx, pp. 429-438; 2 figs.).—The biology of the Plum Sawfly is dealt with under four headings, viz: (a) the Adult; (b) Oviposition; (c) the Larva; and (d) the Cocoon.

Observations carried out over a number of years in fruit plantations in the Eastern Counties show that this pest is an exceptionally variable one and that the fluctuation from year to year is considerable.

The most susceptible varieties appeared to be 'Czar' and 'Victoria,' the least attacked being 'Monarch' and 'Pond's Seedling'—the period of blossoming being probably the factor concerned.

While the application of a Nicotine-soap wash to trees in full bloom and again a week later gave promising results in 1929, there was no significant difference between sprayed and unsprayed trees in 1932.

The fact is stressed that all records of Plum Sawfly damage in England referred to *Hoplocampa fulvicornis* Klug. should be considered as being due to *H. flava* L.—G. F. W.

Potato Eelworm (*Heterodera schachtii*) in the Irish Free State, A Study of the. By J. Carroll (*Jour. Helminthology*, 1933, vol. xi, pp. 137-156; 2 plates).—The Potato Eelworm had not been detected in Ireland prior to 1922, but since that year it is known to occur at several places around the coast, including the islands of Omev and Aran.

The hatching of the eggs was studied, and verification of the fact was made that hatching is stimulated by the presence of Potato root secretion.

The fact was established that no relationship can be said to exist between the hydrogen-ion value of the soil and eelworm abundance.

A series of pot experiments was carried out to ascertain certain facts concerning the disease upon which there is some diversity of opinion.

Extensive field trials and pot experiments were carried out using various soil dressings for the control of the eelworm, and no degree of control was obtained by the use of Creosote Salts—a preparation of crude Naphthalene which contains small quantities of coal-tar derivatives—although it has been stated that this preparation will give a satisfactory control of the eelworm in the field. The only substance which gave promising results in pot experiments was Calcium cyanamide.

While no cultivated crop, other than the Potato, has been found in Ireland to be attacked by *Heterodera schachtii*, the curled Dock was found to be infected with cysts at Rush in 1930. All attempts to induce cross infection between the Potato and the curled Dock strains have failed.—G. F. W.

Ranunculus asiaticus var. albiflorus. By W. B. Turrill (*Bot. Mag.*, t. 9380; Oct. 1934).—A Cretan plant with white flowers about 4 inches across in specimens grown by Mr. G. P. Baker, who collected the roots in Crete. Hardy.—F. J. C.

Rhododendron Bachli. By J. Hutchinson (*Bot. Mag.*, t. 9375; Oct. 1934).—Native of Central China, a plant for the temperate house with small ovate entire leaves distinctly mucronate, and solitary axillary pale lilac flowers with a wide open corolla and five stamens.—F. J. C.

Tulipa kuschakensis. By J. R. Sealy (*Bot. Mag.*, t. 9370; Oct. 1934).—A tulip with remarkably woolly tunics to the bulb, brilliant scarlet flowers with elliptical yellow-edged black blotches at the base. Native of Russian Turkistan. Not easy to cultivate.—F. J. C.

Viburnum alnifolium. By E. Milne-Redhead (*Bot. Mag.*, t. 9373; Oct. 1934).—A N. American species with sterile outer flowers in the inflorescence and nearly related to *V. Lantana*. About 15 feet, shrubby with red-margined, broadly ovate dentate leaves. Berries red. Apparently best on peaty soils.—F. J. C.

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WILD FLOWERS OF THE GREAT DOMINIONS.

By LADY ROCKLEY, C.B.E.

[Read May 8, 1935; Viscount ULLSWATER in the Chair.]

I FOUND it extremely difficult to condense all I had to say about the Wild Flowers of the Dominions in 350 pages; so I fear I am bound to fail to give you any idea in half an hour. I will take the Dominions in the same order in which I have dealt with them in my book,* recently published, namely, according to the seniority in which they obtained "Dominion status." First, Canada and Newfoundland. Not only is Canada the nearest and most often visited, but its wild flowers are most familiar here. During the last 350 years there has been a steady flow of plants from Canada into our English gardens. There we meet with a host of herbaceous plants which are common over here, growing wild right across Canada, among them Bergamot, Columbines, tall Lobelias, Sunflowers, Gaillardias, Rudbeckias, Golden Rods, and Michaelmas Daisies. Many well-known shrubs grow wild there too, such as Kalmias, Snowberries, Sumachs, Ribes, *Berberis Aquifolium*, and so on. There are plants, however, which although they are well loved in Canada have never become really common here. The trailing Arbutus or Mayflower for instance, *Epigaea repens*, with its deliciously scented white flowers close to the ground in spring, is only met with here and there in England. The Bloodroot (*Sanguinaria canadensis*) ought to be more common here as its flowers are among the very first to greet the spring in Canada. They open even before the Dog-tooth Violets (*Erythroniums*) which come up with them in

* Wild Flowers of the Great Dominions of the British Empire. (Macmillan.)
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quantities. The probability is our climate does not really suit these and many other Canadian plants. They are accustomed to be hidden away under deep snow for months, so that they need not fear the intense cold of 20° to 40° below zero—which means perhaps 70° of frost! They are never disturbed by a premature awakening, and when once the snow has disappeared and the wondrous, almost miraculous change to spring has come, they are never “let down” by a nip of late spring frost. They grow on, enjoying the glorious although short summer which follows. It always seems to me that Canadian flowers are in a hurry. They must bloom and ripen fruit before the early frosts of the fall, so their beauty is almost as short-lived as the flowers in those Dominions where summer heat and drought scorch and wither them. The great charm of Canada is its trees: the Maples and Oaks, which turn such wondrous colours in the autumn, and the Conifers. All across Canada from coast to coast Pine trees are almost continuous, except on the great corn-growing plains of the Prairies.

The flowers and trees of Canada group themselves into those of the east and Newfoundland; those of the Prairies; and further across, those of the Rockies and West Coast. Of most of the genera there are eastern and western types. Many common in the Maritime Provinces do not occur further west than Manitoba, but reappear in different species in the Rockies and on the sea coast. Among Roses, for instance, there are *Rosa blanda* and *R. lucida* in the east, the Prairie Rose, *R. setigera*, then on the western coast *R. nutkana*. With Lilies it is the same: *L. canadense* and *L. philadelphicum* in the east, *L. columbianum* and *L. montanum* in the west. The Slipper Orchids, one of Canada's special flowers, are found right across, but the species differ: *Cypripedium spectabile* in the east, *C. pubescens* in the west. Even the common Spiraea, known as Hardhack, which is seen from end to end, has *S. tomentosa* in the east and *S. Douglasii* in the west.

The alpine flowers of Canada are of much interest. They are a survival of a pre-glacial period, and many are the same as the flowers of the Arctic and Northern Europe and Asia, or of the European mountains. Saxifrages, Primulas, Dryas, Butterworts, *Linnaea borealis*, Grass of Parnassus and so on, which are akin to those of Europe, occur in Newfoundland, and again in the highest parts of the Rockies.

I must not linger in Canada, but before leaving I would have you specially notice the wealth of small berries—the Cranberries, Blueberries, and all the small currants and brambles, but particularly the Blueberries (*Vaccinium*) of several kinds, which cover the ground and yield an abundant harvest of fruit. The other point I would stress is that the flowers are not only in the open meadows and prairies, but in the forests, beneath the Fir trees, the ground is carpeted with green and white. Very often it is the Dwarf Dogwood (*Cornus canadensis*), with white bracts which look like flowers, followed by red Bunchberries which cover the earth. There are many of such carpeting plants, Pyrola, Tiarella, Clintonia, or various taller species, Twisted Stalk, Trilliums, Solomon's Seal, False Solomon's Seal or Mitrewort, and many

others which give a very distinctive charm to the miles and miles of Pine forest.

The great beauty of the Rockies must not be forgotten. There the Indian Paint Brush (*Castilleja*), one of Canada's special beauties, which we can rarely enjoy here as it is parasitic, is seen to perfection. The mountain meadows are gay up to the snow line, and in the dry belt of British Columbia many of the plants for which California is famous are found in profusion.

We cannot pass near Vancouver among the great Douglas Firs, or where the red stems of the *Arbutus Menziesii* (fig. 80) overhang the water, without looking at the trees of *Cornus Nuttallii*, 30 to 50 feet high, with the huge white bracts like butterflies fluttering in the sunshine with a background of dark Firs—they are unique. It is worth travelling the 6000 miles from here to enjoy the sight. Thus from coast to coast, from May to September, there is a continuous succession of flowers in Canada.

I must hurry you on to Australia. After what I think is a dull sea voyage across the Pacific, you land near Sydney, and you will very likely wonder why on earth Botany Bay received its name. After a period of drought or in the late summer the earth often looks as brown and unpromising as a floor and as hard as a baked brick. This depressing effect will be intensified by the sight of dead trees. The tall gum trees which have been ring-barked to kill them, so as to plant crops beneath, do not die, crumble, and rot away, as our trees would do under such brutal treatment; they just stand there, bleached white, leafless, and gaunt! They distress the newcomer, yet they are such a familiar sight that the Australian born either never notices them or becomes fond of them!

It is from such an unpromising beginning that the first shower of rain works miracles. The country suddenly becomes green and all the strange flowers which excited the discoverers of Australia make their appearance.

The plants of Australia for the most part are quite unlike any met with elsewhere. The Gum trees or Eucalyptus (of which there are over 300 species) are almost exclusively Australian; and they are everywhere. Each State has some species of its own, but every one has Gum trees large and small. They never shed their leaves and there is a certain likeness in the growth and dull grey-green colour of the majority of them, and a great monotony where hundreds of miles of country are sparsely covered with medium-sized trees of a uniform shape and colour. But the more Gums are studied the more fascinating they become. There is a great difference in their bark. Some have rough thick bark like the Bloodwood of New South Wales; some shed their bark in strips like the Blue Gum (*Eucalyptus Globulus*) of Victoria, so much planted on the Riviera; the Jarrah of Western Australia (which paves many of our London streets) has pale grey bark, and that of the Sugar Gum of Queensland is almost pink. The young leaves show a variety of shades of bronze, red, and grey. Although

the flowers all have the same fluffy appearance and when in bud are enclosed in a hard calyx, they differ in size and are generally white. The most beautiful is the red-flowering Gum of Western Australia (*E. ficifolia*). Gums are of all sizes, from the stunted Mallees of the Saltbush plains to the giant Mountain Ash of Victoria (*E. regnans*), which is known to have attained over 300 feet in height. The Wattles or Acacias are as widespread as the Gums, and different species grow in quantities in every State. We all know the 'Mimosa' of the Riviera, *Acacia dealbata*, now sold in London streets, which is known as the Silver Wattle. It is a beautiful sight when the Wattles are in bloom in their own home. Hillside and plain are golden and the whole air is scented.

The flowers of Australia, like those of Canada, differ in the east and west. As the Prairie divides the one type from the other, so the Saltbush plains and desert divide east from west in Australia. The genera are the same, but species differ. I hardly know where to begin among the flowering shrubs which are one of the features of Australia. *Boronia* is sure to come into the mind of anyone who knows that Dominion, and there are many species with pretty pink flowers, some known as Roses, but the most prized of all is the particularly sweet-scented species wild in Western Australia but grown everywhere. This has small brown flowers with gold inside the petals (*Boronia megastigma*). There are a large number of striking shrubs belonging to the same family as the Proteas of South Africa—many of them very beautiful. The Grevilleas, golden or red, some of which are tall trees, such as *Grevillea robusta*, the silky oak of New South Wales, are a gorgeous sight when in bloom in November. Some of the smaller red-flowering species of the Australian Alps and Tasmania are being proved hardy in this country. Allied botanically is the famous Waratah. It is quite rare in Australia as it grows only in rocky places in New South Wales, but it is often cultivated and great baskets of its huge red flowers, like crimson Artichokes, are sold in Sydney in the spring. Another tree of the same Protea family, the Banksia, is very distinctive. The flowers, like cones of wire but full of honey, stick up stiffly, and the woody-looking seeds are often a feature in the landscape. The Bottle-brushes are another feature, the Callistemons and Melaleucas, with really bottlebrush-like flowers usually crimson—though some are white or yellow. They fringe streams as alders or willows do here, and are common in every State. I was much struck by the number of pea-flowered shrubs, the Jacksonias, Chorzemas, Gomphalobiums, Daviesias and so on, with a great variety of golden and red or bronze flowers. Then there are the Heaths, really species of *Epacris*, which are even more delightful wild than in pots in a greenhouse. I must not run on with the list of flowering shrubs as it would take far too long, and I cannot linger in the scrub of Queensland, that wonderful tropical forest, where Palms and Tree Ferns and climbing plants of many kinds abound, as well as beautiful flowering trees—the Black Bean, for instance, that supplies such fine timber has large scarlet and yellow



FIG 82 —KANGAROO PAUS IN KING'S PARK, W. AUSTRALIA

To face p 288.



FIG. 83 --PIMELIAS AND HOVEAS BELOW GUM TREES, NEAR
MARGARET RIVER, W. AUSTRALIA.



FIG. 84 *PROTEAS, ZANLIDUSCHIA AFTHIOPICA, ETC., NEAR TABLE MOUNTAIN, CAPE COLONY*
(From a sketch by Lady Rockley, 1899.)



FIG. 85.—TREE EUPHORBIA ABOVE UMOINI RIVER, DU REAN, NATAI
(From a sketch by Lady Rich, v. 1899)

pea-shaped flowers. The tree Ferns, *Alsophilas*, and *Dicksonias* all up the eastern coasts are tall and graceful. Such places as Bulli in New South Wales and the Sasafras valley near Melbourne deserve a lecture to themselves.

One of the greatest surprises to me in Australia was the flora of the so-called deserts. The Saltbush plains, dry and sun-baked, covered with sparse bushes of Saltbush (*Atriplex*) and Bluebush (*Kochias*), are monotonous, but they are full of surprising desert-loving plants. The *Eremophilas* or Emu bushes have sweet little pale mauve or white flowers, and as there are many kinds, some are generally to be found in flower. Sturt's Desert Pea (*Clanthus Dampieri*), with its scarlet claws, is really a desert flower, and the large mauve *Hibiscus Hugelii* also, and many Everlastings and *Dampieras* and *Hakeas* are among the astonishments.

Western Australia has the most wonderful flora, and to see it in spring is unforgettable. Not only is there such a wealth of flower but all are strange, and only to be seen wild in that State. Together they make a show which even the best time on the Cape flats cannot surpass. The whole effect is thrilling. I collected over fifty flowers I had never seen before in one afternoon's walk near Perth. I can only mention one or two of them. First, the Kangaroo Paws, *Anigozanthos* (fig. 82). The largest is bright emerald-green and the stem and calyx are crimson. There are yellow, scarlet, and a jet black (*Macropodia fumosa*) species. The flower is really golden, but the whole so thickly covered with black woolly hairs it looks inky. I must mention *Leschenaultia biloba*. The blue of the flowers is perfect, not a nurseryman's blue which an artist would call purple! The bushes, 2 to 4 feet high with heathlike foliage, have these lovely sky-blue flowers in the spring, and in places there are masses of them. There are no Tree Ferns or true Palms in Western Australia, but among its many flowers grow Cycads (*Macrozamia Fraseri*), known as 'Zamia palms,' and the quaint Grass Trees or 'Blackboys' (*Xanthorrhoea*). They are 6 to 15 feet high with great heads of streaming grass-like leaves. These are often wreathed with bright climbing plants and are very conspicuous. The ground in Western Australia is covered as thickly as possible with flowers. There are Swan River Daisies, *Dampieras* and Red Runners (*Kennedya coccinea*), with countless little Orchids, Trigger plants (*Stylidium*), Fringed Lilies (*Thysanotus*), and *Patersonias* growing up amongst them. Altogether West Australian spring flowers are about the most beautiful imaginable.

New Zealand is a complete contrast. It has none of the typical Australian things, no Gums or Wattles, but an entirely distinct flora, and the whole aspect is absolutely different. The climate is, of course, more like our own warmest counties and every year more New Zealand plants are being grown over here, and our English flowers do so well out there that much of the country has been made to look very homelike, with Gorse and Ragwort and Wild Roses, but once away into the wild New Zealand is unlike anywhere else. Most of the

soon as the Karroo is reached quite a new collection of drought-resisting plants and succulents appears. Many of the small bushes have greyish leaves and small Daisy flowers and are good for fodder; but the Rhenoster Bush (*Elytropappus rhinocerotis*), with small scaly leaves, which covers large tracts of country, is very poor feed and disliked by farmers. The Aloes are a great beauty when in flower, with large heads of brilliant red and yellow standing up stiffly from their sword-like spiky leaves. Then the Euphorbias too are very striking, with huge heads of spiny fleshy branches (fig. 85). Now that it is possible to motor great distances over the dry lands towards Namaqualand and the south-west the fashion for studying and collecting all the strange desert plants has grown rapidly. Many of the Mesembryanthemums with gaudy magenta, yellow or white flowers and three-cornered fleshy leaves are met with, and in addition to these more obvious types there are others so like the stones among which they dwell as to be scarcely distinguishable. The small button-like growth splits open like the husk of a broad bean and out comes a flower larger than the button itself. Besides those queer little plants known as Lithops and Conophytums and other allied genera, there are weird plants like the Cacti of America, Stapelias, Huernias and Hoodias with flowers like starfish, and Ceropegias with greenish flowers shaped like small umbrellas, and many other curiosities.

I have not time to tell of all the annuals which are becoming so popular here: Ursinias, Nemesias, Arctotis and so on. They are not always to be seen as they must have just enough rain at the right moment to start the seeds into growth, but once started they grow rapidly, produce a marvellous display of colour and quickly ripen their seed, which may lie dormant for years.

The Bush Veld has again quite a distinct flora from the Cape region, the coastal forest (which I have not had time to touch on), or the Karroo or desert. The trees are small and far apart, never a forest, but never really quite open plains. The many kinds of thorny Acacias are the most common type of tree and there are some lovely flowering shrubs among them. The Pride of the Cape is of outstanding beauty. A Bauhinia with crimson flowers, and a Clerodendron (*C. myricoides*) with sky-blue and pale green petals, are particularly charming. Everywhere among the scattered trees grow the lovely bulbous plants, the same families but different species from those at the Cape: Fire Lilies (*Cyrtanthus*), Haemanthus, Wand flowers (*Dieramas*), Hypoxis, Lachenalias, Red Hot Pokers, Agapanthus and so on, and near the streams, Crinums. It is a sheer impossibility to give the names of even a quarter of the flowers which belong solely to the Union. There is no time left to speak of the carpets of Everlastings on the Drakensberg, or the Kaffir Bread Trees, the Cycads, and Strelitzias near the coast, or the Clivias, Gloriosas and Sandersonias hidden away in the kloofs of Natal.

I have endeavoured to point out some of the chief characteristics of each Dominion. I have given a rapid picture of the dark Pines of

Canada lit up by white Dogwood and Indian Paint Brushes and the sweet spring flowers. I have tried to show that there is a riot of colour and delightful strange plants in many parts of Australia in contrast to the bare baked earth so often associated with the Commonwealth. I hope I have called up some of the charm of a New Zealand forest with waving tree ferns, and its white-flowering shrubs and alpine flowers, and lastly, we have wandered through the bewildering multitude of South African flowers and strange desert growths.

At this moment, when our hearts are full of rejoicing, I feel sure that all who know anything of the great beauty of the plants of our King's Dominions beyond the seas must have a feeling of thankfulness for the flowers as well as for the many other blessings of the British Empire.

IRRIGATION FOR HORTICULTURAL MARKET CROPS.

By F. A. SECRETT, F.L.S.

[Read April 24, 1935; Mr. GEORGE MONRO, C.B.E., V.M.H., in the Chair.]

It is natural that many growers have been deeply concerned over adequate water supplies owing to the periods of drought experienced the last few years.

To-day there is a constant demand for high-grade vegetables, but very little sale for poor and inferior produce. Tinned vegetables and fruits are becoming more and more popular, and if the green-vegetable grower is to regain the trade he has lost to the canning industry he must put high-quality vegetables upon the markets to command and retain the attention of the buyer. He must also see that his goods receive advertisement.

The housewife has found that vegetables prepared in a tin save her labour, but she has not considered another factor to which she must give her earnest attention in the future: this is the effect of correct diet upon the health of those under her care.

The public to-day need education in regard to diet, and many are realizing that fresh vegetables are a most necessary food. A leading doctor visited one of my holdings a few weeks ago and he remarked that the medical profession at the present time is giving more attention to this question of diet. He expressed the opinion that if more fresh well-grown vegetables were consumed, our hospitals would not be so overcrowded.

We growers must give more attention to improving quality rather than to increasing quantity. It is an easy matter to increase the acreage of crops without building up the necessary organization and equipment to deal efficiently with that extra acreage. Unless attention is given to this, quality is bound to suffer.

As growers we have to realize that water is an essential plant food and a medium by which a plant is enabled to form an effective contact with the soil. Water is also a transporter of food materials which by its aid are absorbed by the plants. It also forms a medium in which beneficial micro-organisms thrive and move about in the soil. In view of this, an adequate water supply is a necessity on every well-organized holding.

Are growers possessing both capital and a water supply taking sufficient advantage of the research work carried out on this irrigation problem, and installing the necessary equipment for watering their crops? It has been argued that dry seasons are rather the exception than the rule, and although this may be true, our climate is certainly changing, and the early part of the year is generally very dry. For the last few seasons it has been almost impossible to grow

such crops as Cauliflowers without the aid of irrigation. The installation of an irrigation plant solves many difficulties, making it easier to regulate the crops, and a grower would be well advised to farm 50 acres of land with the assistance of irrigation rather than a larger area without. Personally, I have been using irrigation plants since the year 1921, and although there have been wet seasons not a single year has passed when the plant has not justified its existence.

For those who desire to make a study of this question a book entitled 'The Plant in relation to Water,' by MAXIMOV, published by George Allen & Unwin, is worthy of attention.

In the chapter dealing with the effect of environment on absorption MAXIMOV says that "one of the factors which most strongly influences the water supply of the plant is undoubtedly the temperature of the soil. As the general regulator of the rate of chemical reactions as well as of vital functions, temperature must naturally exert an influence on the rate of absorption of water by the root."

For this reason it is unwise to engage in irrigation during the early spring when the land is cold. In fact, wilting of plants can be caused by watering while the soil is at a low temperature.

In summing up this question MAXIMOV says, "Soil temperature is a factor which directly influences the rate of water absorption by roots. Other factors may also exert an indirect influence on the water supply of the plant, by checking or stimulating the growth and development of the root system. Even the temperature of the soil is not without influence and the root system develops better though more slowly with a lower temperature. Of the soil factors which chiefly influence the root mention may be made of the composition and concentration of the soil solution, the amount of oxygen in the soil and the presence of substances noxious to the roots (soil toxins)."

Those who force Tulips will realize how true this statement is. We endeavour to obtain a low soil temperature after boxing Tulips before they are placed in the houses. There is no doubt that this treatment has a beneficial effect on the root system which develops better though more slowly with a low temperature. It has also been proved that when the Tulips are taken into the house a warm soil temperature is beneficial, and it may be that the first watering of Tulips is sometimes given too soon after housing. Possibly for this reason many early Tulips show better results on staging than on the cold floor of the house.

In corroboration of this MAXIMOV states, "We have examined the influence of a lowered temperature on the activity of the root system, and have seen that cooling of the soil not only impedes the absorption of water, but may even induce the wilting of a plant in moist soil."

Another important question is that of the influence of oxygen, or rather of the absence of oxygen, on root activity, which will be dealt with later in the paper.

Dealing with the absorption of water by the aerial organs of plants it has been authoritatively stated: "The surfaces of leaves are not

infrequently moistened by rain or dew, and long ago it was suggested that leaves are capable of absorbing water in spite of their cutinized epidermis and that the water so absorbed must play an important part in the water régime of the plant. LUNDSTRÖM holds that the capacity of leaves to absorb rain and dew is widely spread, even among the plants of temperate climates, and mentions certain structural peculiarities, such as hairs, that may be regarded as adaptations for the absorption of water. This has further been proved by the experiment of HALES who immersed the leafy tip of a cut branch in water and observed that it remained fresh considerably longer than a similar branch entirely deprived of water. It follows that every cell not saturated with water, no matter in which part of the plant it is situated, when brought into contact with water must absorb this at its surface. The most important question is whether the amount of water so absorbed plays any perceptible rôle in the general water balance of the plant."

MAXIMOV sums up this question by saying that "the moistening of the leaf surface with water may lead to harmful consequences as it increases transpiration, thus accelerating the loss of water and bringing nearer the moment of wilting. This rapid drying after surface wetting is well known to practical workers: gardeners avoid watering plants directly in the sun's rays and farmers know that grass mown when it is dewy dries better and more rapidly. In conclusion the absorption of water by the aerial parts of the plants plays an important rôle in the water régime of tropical plants only. Other plants are obliged to content themselves with the water supplied by their roots. Dew and light rains, in so far as they only moisten the leaves on the surface of the soil, without penetrating the latter, are probably not directly utilised by our common plants."

These few quotations from MAXIMOV have been given as they have a direct bearing on a point raised later.

In this country irrigation is in its experimental stage and although I have been giving deep consideration to the matter for a number of years I do not claim to be an expert. Nevertheless I hope these few observations may be helpful. In growing vegetables we are competing with a country (Holland) which has a movable water table, and what Nature has done for Holland we have to do for ourselves.

Irrigation cannot be successfully applied on all soils: heavy soils do not respond to this treatment but light alluvial sand or loamy brick earth is most suitable. Again, water may not always be available, as in many cases where urban development has taken place round London, the water table has been so lowered by drainage and pumping that the subsoil water has sunk many feet, and in some cases has been entirely dried up, as in certain parts of Essex. In urban development no thought is given to the needs of agriculture, and unless this industry receives more consideration than it has in the past, it is bound to suffer.

The "powers that be" are apparently more interested in the

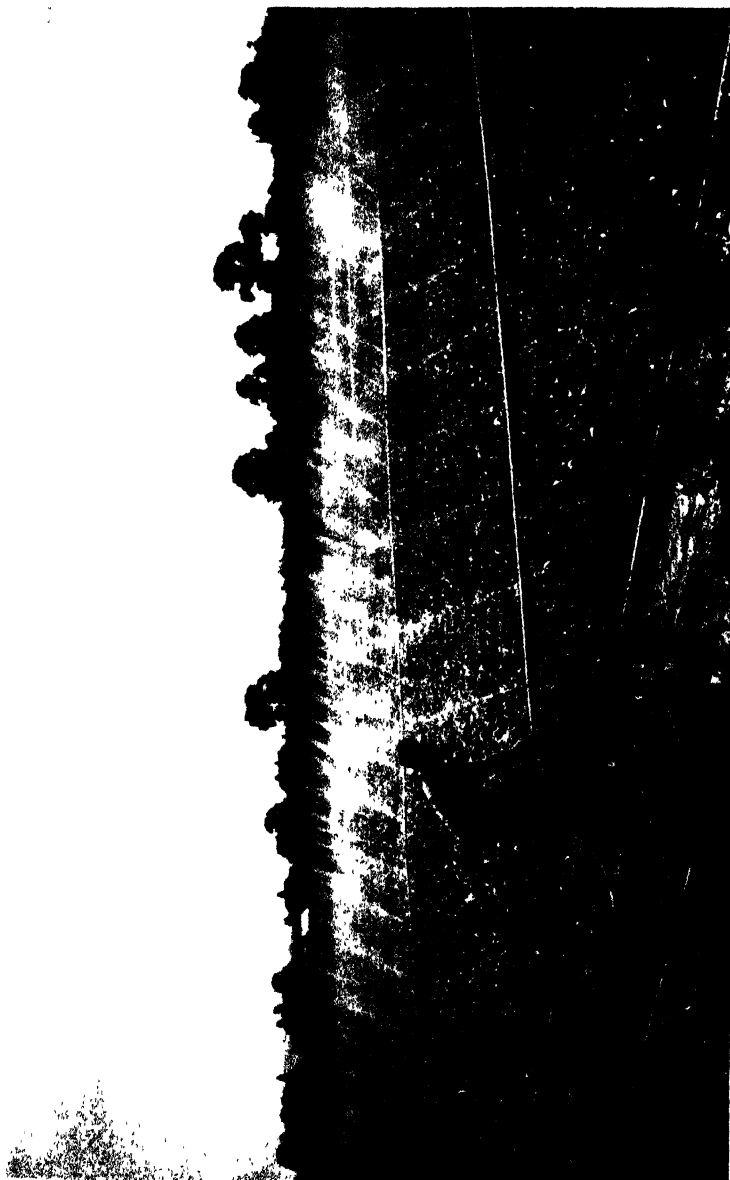


FIG. 86.—OVERHEAD IRRIGATION OF GROWING CROPS

[To face p. 296.



FIG 87.—IRRIGATION OF GROWING CROPS THE PERMANENT MAINS



FIG. 88 -- IRRIGATION OF GROWING CROPS THE PUMPS, ETC



FIG. 8. —SEED SOWING ON IRRIGATED LAND
(See p. 300.)

planning of agriculture than in the practice of it. It takes many years to bring land to the condition suitable for the growth of high-grade vegetables, and practice must precede planning. Produce cannot be packed to comply with the National Mark standards, unless it is of a high-grade quality and has been well grown. If those in authority could be brought to realize the importance of our industry many of the terrible mistakes made to-day would not occur. Work which has often taken a generation to accomplish is swept away in one move with no more thought or consideration than a local authority would give to moving a gipsy caravan.

For high-grade vegetables, land must possess a high humus content as inorganic manures cannot produce the same results as organic.

This is another problem to be faced to-day closely connected with this question of irrigation. It is useless to irrigate poor and impoverished land as unless plant food is available considerable damage will be done, and there is little doubt that we are suffering for our neglect of this problem. We are sending vast quantities of valuable manures out to sea, although many scientists are now working on this question and it is probable that in the future science will try to save this waste material for agriculture.

In a recent publication a scientist suggested that successful results could be obtained with inorganic manures. Another high authority was exploring the possibility of converting much of our waste material into humus. Personally, I am not in agreement with endeavours to bolster up the old idea of inorganic feed but place far more confidence in those who are endeavouring to find an organic material to replace horse manure.

If the cycle is broken at one point by feeding vegetables for human consumption entirely with inorganic manures, then it will be broken at another point and our hospitals will be filled. The true cycle of vegetable to manure and manure to vegetable must be maintained, and if an attempt is made to destroy this, punishment will follow.

In dealing with the irrigation plant, let us speak first of the water supply. In some cases it is possible to obtain an efficient supply from a supply company, when the cost is reckoned by the thousand gallons. Provided it is taken from a fairly large main, this source of supply would be suitable. If a high pressure is not available, this can be rectified by the erection of a large overhead tank, one distinct advantage of which is that the water becomes softened by its contact with the air.

If underground water has to be relied upon it is wise to put down a bore and take samples of the water for analysis before incurring the expense of sinking a well, as in some districts the water is so brackish that it is not suitable for the purpose. In digging a well one should stop short of the London Clay as it is my experience that water which has been contaminated by clay is injurious to all plant life.

At Marsh Farm I was fortunate in having a river upon which I relied for irrigating my fields, and although this holding had been under

irrigation for twelve years I never saw any evil results from the use of this water. In fact I feel that river water is preferable to any other supply.

Regarding power for pumping : if electricity can be purchased at $1d.$ to $1\frac{1}{2}d.$ a unit preference should be given to an electric motor rather than to any other form of power. In my own case an efficient electric supply was *not* available, and I had to resort to a 30-horse-power Diesel engine driving a 6-stage centrifugal pump. One should be able to generate a pressure of about 350 lb. to the square inch at the pump head and 80 lb. to the square inch at the commencement of the spraying lines. Although this pressure may not always be necessary there are occasions when it is useful.

An irrigation plant which requires moving of pipes is very expensive to control, and a permanent system should be put down with all mains in a fixed position : if a plan of the farm is used it is easy to get a satisfactory lay-out. This should be so arranged that no spraying line is more than 300 feet long, 200 feet being better. The valves on the permanent mains should be 40 feet apart, connexions on these valves to the spraying lines being made by armoured hose (fig. 86).

Unless some protection is given to these mains and valves they are liable to be damaged by careless horsemen or tractor drivers, and wherever permanent mains are put down lilac hedges can be planted by the side of the main (fig. 86). For early work protection is necessary and lilac hedges form a very fine windscreen, and if named varieties are used they soon pay their way in cut bloom.

There are several different types of spraying lines which should be run at about 40 feet apart. The lines are fitted with nozzles at 2 feet centres, specially designed and accurately manufactured to very fine limits so as to give a maximum throw of water with maximum dispersion and the breaking up of the jet of water into drops corresponding to those found in gentle rain. Special nozzle arrangements can be made where extra heavy watering is required and for this purpose I should recommend the multi-nozzled line which has 7 jets inserted diagonally across the pipe. Two other effective lines are the Wizard oscillating line and the Arroseur Automatique Sprayer. By variation in pressure the nozzles will break up the water into an extremely fine mist.

Aeration Equipment and Plant.

Research has shown the advantages that can be obtained by increasing the oxygen in the water used, and a special aeration plant has been designed to dissolve the maximum possible amount of air in the water.

The system consists of a small compressor and receiver unit automatically controlled, driven by the power unit, of such capacity that the air delivered is the exact amount that the water can dissolve. It is passed into the water through a specially designed diffuser which breaks up the incoming air into minute particles so that it is readily absorbed by the water.

Solutionizing System and Solutionizer.

A solutionizing plant has been designed to add minute quantities of soluble chemicals at any desired rate from 1 in 3000 to 1 in 10,000 parts. The main feature of this system is that it is self-regulating—that is, once it has been adjusted to give, say, 1 in 3000 parts any variation in the amount of water used will cause a corresponding variation in the amount of chemical drawn up from the storage tank. Suppose, for example, that an acre is being watered the solutionizer will add chemical to the water at the rate of, say, 1 in 3000 parts. If the spraying lines are reduced in number, then the amount of chemical used is automatically reduced in proportion, so that the rate of 1 in 3000 is maintained, or any other predetermined proportion.

The apparatus is simple, without moving parts, and has the advantage of being combined with a flow meter so that the exact rate of irrigation can also be noted.

The solutionizer consists of a solution tank in which a certain quantity of fertilizer or other chemical is put, and then filled with water. From a Venturi tube fixed in the delivery pipe from the pump the connexion is run to the bottom of this tank, which forcing the water through the bed of the chemical returns a small quantity into the delivery pipe.

At the present time an engineering firm is experimenting with a solutionizer that can be fitted at the commencement of the spraying lines. This will be a great advantage as control plots are essential, and it is very difficult to obtain definite data with our present system. If a solutionizer can be fitted to each individual run it will be of great assistance in experimental work.

With regard to filtering the water, it must be remembered that the nozzles used in spraying lines in some cases are very small, and unless some precaution is taken, fine particles of sand get through, certain nozzles become blocked, and an equal distribution of water is not obtained.

My equipment is capable of watering 4 acres of land at one time with the equivalent of one inch of rain in 8 hours. About 1000 ft. of spraying lines are required for each acre, so if 8000 ft. of spraying lines are available, while 4 acres are being watered another 4 acres of lines can be erected, and thus no time is lost.

It is one thing to have a plentiful supply of water, but quite another matter to use it efficiently, and no present method of distribution is perfect. However, there are now two or three firms giving their whole attention to this work, and every year brings improvements in their lines.

In irrigating land there are a few simple factors which must be remembered. Never irrigate a crop unless it is showing signs of distress; if the crop will carry on and complete its natural growth, watering is best left alone.

Never irrigate land which is poor and lacking in humus as this

would further impoverish the soil. Certain crops can be watered at any time of the day, while other crops have to be watered at night, and as in all gardening, this question resolves itself into an ability to use one's powers of observation combined with common sense.

It is necessary that water should be applied to imitate natural rain as closely as possible, and to accomplish this the water must be atomized. Good soil can be ruined by flooding, and there is a deal of difference between flooding land and irrigating it. In the one case the soil particles become embedded together so that the soil is devoid of oxygen and no capillary water can function, in the other case the soil is kept open and free.

Let us now deal with irrigating dry land in order to plant or raise a seed crop. One cannot be dogmatic on this question as soil and conditions vary so much in different localities, and the work mentioned has been carried out on an alluvial silt soil. Before watering, the land should be cleared of all weeds and should be in a firm condition. If available, the surface should be mulched with fairly long stable manure. The spraying lines are then erected and if the soil is very dry, the equivalent of at least one inch of rain is necessary to soak down 9 inches. On an alluvial silt soil it is possible to plough the following day, and care should be taken that a larger area is not watered at one time than can be handled quickly, as the water soon evaporates in hot weather.

Many growers have asked why they have failed to obtain a crop after watering, and in every case their troubles are attributable to the fact that they have watered *after* ploughing instead of before. If this is done the soil becomes in a sodden condition, the water quickly evaporates, and the crop is bound to fail. Watering must precede ploughing and cultivation.

When the land is ploughed 9 inches deep a sub-soiler should follow the plough which will break up at least another 6 inches. The manure is then drawn into the furrows and a light wooden roller follows, with a light seed harrow attached (fig. 89). On no account must a steel roller be used for this purpose. (By carrying out the work in this way no marks are left on the ground from the horses' feet.) The object of doing this is to bring the supply of capillary water into action again. The breaking up of the subsoil and the saturated condition of the manure assist in drawing up the subsoil water, and if the work is carried out carefully, land so treated should not require any subsequent watering.

Mulching the land with manure is also an advantage as a certain amount of plant food is washed out of the manure and becomes more quickly available; it also prevents the land becoming poached during watering. If a supply of manure cannot be obtained, this work can still be done, but care must be taken not to compress the soil too tightly, otherwise the land quickly becomes hard and dry. Although hoof would not have exactly the same beneficial effect as straw manure, yet rather than irrigate without a dressing it is better to use $\frac{1}{2}$ ton of hoof to the acre (dust to $\frac{1}{2}$ inch), applied before irrigating.

After irrigating, a dressing of meat meal or very finely ground hoof should be applied to the surface and harrowed in. The land is now ready for drilling seed or planting. If a seed crop is to be sown such as Lettuce or Endive the soil is best left unrolled after drilling, as if the soil is too tightly compressed evaporation will be very great. Keep the soil loose and evaporation will be checked. If a roll is used immediately after drilling, in all probability such seeds as Lettuce will fail to germinate and quickly rot. If the weather continues dry the crop should be rolled with a light wooden roller 4 days after drilling, and if the weather is hot a dressing of about 10 cwt. of hydrated lime to the acre should be given as this tends to keep the land cool.

As soon as the seed is through the crop should be hoed. It is better to thin out young Lettuce by hand during hot weather, as if this work is done with a hoe the soil is drawn away from the surface roots. Land to be planted with a Brassica crop should be given a dressing of hoof as before mentioned and the same system carried out. The one danger in watering for a Brassica crop is club root.

After watering, the land should not be in a sodden condition, but in a friable one. Half a ton of hydrated lime to the acre should be harrowed into the surface, and immediately the plants have recovered from their move, the land should be worked between the rows with autocultivators or horse hoes. As a matter of fact the problem resolves itself as to the correct aeration of the soil. If the land is flooded by irrigation the soil particles will run together and the soil will be devoid of air and the result will be club root.

Before the second horse-hoeing it is an advantage to give a dressing of mixed nitrates, and in the case of certain Brassicas, such as Cauliflowers, it may be necessary to give subsequent waterings. Before these are given, a light dressing of mixed nitrates should be applied.

Let us now deal with irrigation over a growing crop: this is often difficult and more complicated, and the time for carrying out the work is limited.

For a number of years it has been impossible to grow early Cauliflowers in the Home Counties without irrigation. If this crop is grown on a brick earth it is wise to baulk up the Cauliflowers and run the water down the baulks, but my soil so resembles a sieve that the water simply runs into the subsoil, and overhead irrigation has to be resorted to.

Before the curd has formed this may be engaged in on sunless days during the daytime when little damage will be done, but after the curd has developed overhead watering should be carried out during the evening hours or in the early morning. One good watering is better than half a dozen sprinklings, and provided the soil is moved the following day the water will be retained. After the curd has formed, if overhead irrigation is carried out while the plant is warm from sun heat, bacterial rot is bound to follow. This rot takes place in the centre of the curd and cannot be detected when the Cauliflowers are packed, but when they arrive in market they are a corrupt mass.

A heavy thunderstorm during hot weather will often give the same result. For such crops as Primo Cabbages and Brussels Sprouts the same difficulties do not arise. During dry weather overhead irrigation is absolutely essential for the production of such crops as Radish. On one of my holdings during the hot weather last summer Radishes were cleared and sown again, cleared again and the ground resown in 27 days. Radishes appreciate a light dressing of high-grade meat meal which is given before sowing.

Overhead watering on Cos or Cabbage Lettuce to mature the crop is hazardous work, but if the preparations have been carried out as suggested it should seldom be necessary. There are occasions when the heat is so intense that the soil dries out and the crop refuses to mature, then overhead watering becomes necessary. This should not be carried out in hot sunshine but on dull days or in the evenings and early mornings. The equivalent of $\frac{1}{4}$ inch of rain is often sufficient and a heavy watering is seldom necessary. The water should be finely atomized and the surface of the soil moved as soon as possible. This is a very important point, as successful results cannot be obtained unless hoeing is carried out immediately after overhead irrigation.

I learnt much of this work from a French peasant in my employment who was a past master in this type of work. In fact I often feel indebted to him for the amount of instruction he gave me in the finer arts of gardening. I started experimenting to see if plants could be stimulated into growth by watering in the form of mist without saturating the soil, and I came to the conclusion that instead of decreasing transpiration of the plant I increased it. I then explored the possibilities of aerating the water and adding a solution in very weak quantities. To-day this work is in its experimental stage and I am not in a position to make any definite statement regarding it as I feel that all research work should be tried out for at least three years before definite statements are published. Neither would I advise a beginner to engage in it except on a small experimental scale. I am not a scientist and the results I have obtained may be due to some factor not taken into account.

It is my belief, however, that during very hot weather when plants are suffering from nitrogen shortage, and in all probability oxygen shortage in the soil, they can be stimulated by water that has been aerated and solutionized given in the form of a heavy mist. MAXIMOV proved that plants do absorb water through their aerial organs. He also states that only in certain types of tropical plants can water absorbed by aerial organs of the plants play any important part in the water régime. Other plants are forced to content themselves with the water supplied by their roots.

With this I am in agreement, yet I am driven to the conclusion that during hot weather when plants are suffering shortage they can absorb food through their aerial organs, and that while ordinary water might do damage, the lack of nitrogenous food can be compensated for in the way suggested.

I have already described the solutionizer and aeration plant. The compounds with which experiments are being carried out are used from 1 in 3000 to 1 in 10,000 parts and results have been really remarkable. Last year Cauliflowers of the varieties 'White King' and 'Pioneer' were sown on the 1st July, and the whole crop was marketed before the 15th September, 95 per cent. of them being best heads. The land was watered before planting took place, and the area was solutionized four times. Here is a problem which grower and scientist will have to work out together.

Anyone engaging in the type of horticulture mentioned here will find that his manure bill goes up by leaps and bounds, that his labour has to be increased, and at the same time his turnover also rises.

Some growers are able to obtain good produce in dry weather, but their number is very limited; dry-weather gardening is a science. Personally I prefer to see dry seasons, even on my holdings where no irrigation is available, for situated as we are on these islands, which are specially suited for vegetable growing, I am convinced that the trouble in dry weather is not so much drought as poor cultivation and lack of humus.

This brings me back to where I started. If good crops are to be grown in this country means will have to be devised of supplying the grower with humus in some form or another.

One meets many difficulties in irrigating horticultural crops and every year this industry is becoming more and more dependent upon science. Civilization has in many ways upset the balance of Nature.

Science to-day is not only concerned with the preservation of human life, but unfortunately with the destruction of it also.

Happily there is a time coming when men will beat their swords into ploughshares, and then, and not until then, will horticulturists' difficulties and anxieties be overcome, and the groan and travail of Nature be removed.

SOME DISEASES OF ORNAMENTAL PLANTS CAUSED BY THE VIRUS OF TOMATO SPOTTED WILT.

By KENNETH M. SMITH, D.Sc., Ph.D.

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GLASSHOUSE crops of all kinds are prone to infection with fungi and bacteria which give rise to such diseases as mildews, blights, moulds, and rots, and most growers are familiar with these. There is, however, another and more insidious kind of plant disease which the grower of glasshouse crops, and of ornamental plants in particular, must learn to recognize. This type of infection, known as a "virus disease," is definitely on the increase among ornamental plants and is gradually becoming one of the major problems of the horticulturist.

It is not within the scope of this article to discuss the nature of a "virus." It must suffice to state that a virus is an infectious disease-producing agent which is too small to be seen, even with the highest power of the microscope.

Viruses attack all manner of living things ; man, domestic animals, birds, fish, plants of every kind, insects, and even bacteria themselves are all susceptible to this kind of infection.

It has been stated that virus diseases are infectious and although this is true for the majority of plant viruses, they are infectious in rather an unusual manner. Most of them depend upon plant-feeding insects for their transfer, in Nature, from diseased to healthy susceptible plants. Any casual insect visiting the infected plant, however, will not do for this purpose, but each plant virus depends upon a particular insect species or type for its dissemination from plant to plant. In this country the two types of insects concerned in the spread of plant viruses, or "vectors" as they are called, are greenfly (aphides) and thrips. Every grower knows how numerous these insects are in most glasshouses, so that the widespread nature of plant viruses is not surprising.

The impossibility either of seeing a virus or of growing it on a nutrient medium outside the plant, as can be done with most fungi and bacteria, makes the classification or orderly arrangement of plant virus diseases a difficult problem. It is therefore necessary for the reader to bear in mind the difference involved in speaking of a *virus* and a *virus disease*. This article describes a number of virus diseases but only one virus is concerned in their production. In other words, this one virus agent or entity is capable of attacking a large number of different plants upon each of which it produces quite different effects. There are other viruses which also attack ornamental plants, but they are not dealt with here.

In Australia, about the year 1915, there was an outbreak of a serious virus disease on the Tomato crop. This disease, named tomato spotted wilt, became, and still remains, the cause of much loss to Tomato growers in that country. In Cambridge in 1929 a plant of *Solanum Capsicastrum* was received which showed on its leaves markings in the form of numerous concentric rings. Inoculation of the sap from this plant to Tomatos produced the disease of tomato spotted wilt, thus proving the *Solanum* to be infected with this virus, hitherto described only from Australia. This, then, was the first record of the disease in Europe, and since that time the virus has spread all over the British Isles and is also spreading right across the United States of America.

One of the characteristics of the virus, which makes its control a more serious problem from the horticulturists' point of view, is its ability to attack all sorts of different plants. This is unusual behaviour in the plant viruses many of which are confined in their attacks to a restricted range of plants.

It is the purpose of this article to describe the diseases caused by the spotted wilt virus on a number of ornamental plants and give certain recommendations for control so that growers may be enabled to recognize this dangerous disease and take the necessary steps for its eradication.

How the Virus Spreads.

Virus diseases can be spread from plant to plant in a variety of ways which differ according to the virus concerned. These methods of spread may be briefly summarized as follows: (1) by inoculation of infected sap into the tissues of healthy susceptible plants; (2) by the agency of insects; (3) by the propagation of bulbs, tubers, cuttings, rhizomes, etc., of infected plants; and (4), very rarely, by the seed of infected plants. The virus of spotted wilt is spread by the first three of these methods, but the grower need consider only (2) and (3), *i.e.* by insect agency and by the vegetative propagation of infected plants.

The only kind of insect concerned with the spread of the spotted wilt virus is the thrips (*Thrips tabaci*), a very minute insect, about one millimetre in length and very narrow in proportion to its length, which is present in most glasshouses. Its presence can be recognized by its characteristic feeding marks on attacked leaves which appear as silvery patches with small dark specks of excreta scattered over the patches. This insect in its young, or larval, stages feeds upon a plant which is infected with the virus of tomato spotted wilt, and when it migrates to a fresh plant, which it usually does in its fully grown and winged stage, it infects this plant with the virus disease. Since both the thrips and the virus which it carries attack a wide variety of different plants this method of spread is a most effective one. It must be understood that it is necessary for the

larval insect to feed first upon a virus-infected plant before it can infect a healthy one with the disease.

Virus diseases of plants differ from plant diseases due to other causes in that the infective agent or virus is present in all parts of an infected plant with the usual exception of the seed. It follows from this, therefore, that all bulbs, tubers, rhizomes, and cuttings, if taken from a virus-infected plant, will perpetuate the disease. This fact is particularly unfortunate in regard to ornamental plants because so many of them are propagated in this manner.

One of the difficulties experienced in combating the spotted wilt virus is the large number of different diseases which it is capable of producing on the various host plants and the consequent inability to recognize the infection as due to this virus. For this reason it is proposed to describe the diseases produced on those ornamental plants which the writer has found from personal experience to be the most commonly affected.

Solanaceae. Tomato.

Since it is upon the Tomato plant that the virus is frequently first introduced on to a grower's premises, the symptoms of the disease on this plant will be briefly described. For further details the reader is referred to a leaflet on the subject issued by the Ministry of Agriculture and Fisheries.

The first sign of infection on a Tomato plant is a tendency for the younger leaves to curl downwards and inwards; there may also be a slight thickening of the leaf veins and the development of one or two rings. The next stage is characteristic and should enable the grower to recognize the disease without difficulty: on the upper surface the young leaves assume a reddish-bronzy hue with an almost metallic sheen. This bronzing may cover the whole leaf or, more frequently, may occur in separate spots or blotches. In a young plant the next development is usually a destruction of the leaves and sometimes of the stem with the consequent death of the plant. Plants as a rule, however, are not killed but linger on in a semi-moribund condition with a yellow mottling on the leaves which are frequently distorted in shape.

Since the Tomato is one of the *Solanaceae*, and since plants of this family are particularly prone to attack, it will be convenient to consider first the effects of the virus on some of the ornamental *Solanaceae*.

It may be well to emphasize at this point one characteristic of attack by the spotted wilt virus on *Solanaceous* and other plants; this is the formation of numerous concentric rings, usually with a central mark or spot. This ring formation is shown at its best on *Solanum Capsicastrum*, the Winter Cherry, and any plant with such ring-like markings on its leaves should at once be destroyed. *S. Capsicastrum* is an important host because it offers the virus one means of "carrying over" the winter, and since the plant is largely propagated

by cuttings and is not very seriously affected by the disease, it is also instrumental in spreading the virus from one locality to another.

In addition to *S. Capsicastrum* the following plants, all belonging to the Solanaceae, have been found naturally infected with the spotted wilt virus: *Streptosolen Jamesonii* (fig. 90), *Browallia speciosa major*, *Petunia* sp., *Physalis* sp., *Salpiglossis* sp., *Schizanthus* sp., *Solanum Melongena*, the Egg Plant, and *Capsicum annuum*. Other susceptible plants belonging to this family are the various species of *Nicotiana* and *Hyoscyamus niger* (Henbane).

The kind of disease produced on all these plants is of the same general type. In some there is more destruction of the tissue resulting in dried spots on the leaves; this is particularly true of *Nicotiana* spp., many of which are killed outright. The symptom which most of them have in common is, as already stated, the development on the leaves of ring- or wave-like markings. Frequently there occur numerous concentric circles or pale spots concentrically zoned. As a rule such diseased plants grow very slowly, are stunted, and produce malformed secondary growth.

Papaveraceae. Iceland Poppy.

The youngest leaves of affected plants are distorted and yellowish and the whole centre of the plant is pallid and stunted. The flowering stems are usually twisted and bent over, while the flowers may be abnormal in shape and sometimes burst out laterally from the confining sepals.

Cruciferae. *Matthiola* sp. Stocks.

On Stocks (*Matthiola*) the disease caused by the spotted wilt virus is most severe and characteristic. The leaf edges are twisted and the whole leaf is crinkled and curled; occasionally the leaves are almost tubular and may be completely reversed. The lower leaves show marked yellow mottling with some destruction of the midribs; this in time turns to a general yellowing of the whole of the lower part of the plant. The topmost leaves exhibit mottling of two shades of green with some yellow flecks; the crinkling and distortion of the leaves are less pronounced at the top of the plant. Occasionally leaves may show a broad band of yellow down the centre with an outer edge of green which is abnormally dark. The outstanding characteristics of this disease on Stocks are the crinkling and yellowing of the leaves (fig. 91).

Cauliflowers, which are sometimes forced in glasshouses, are also susceptible to the virus. Young plants, recently infected, may show a few well-defined concentric rings on the centre leaves. The older leaves in plants long infected show pronounced mottling of dark and light green with the darker shades close to the leaf veins.

Tropaeolaceae. *Tropaeolum* sp.

The garden Nasturtium is very frequently attacked by the spotted wilt virus and the writer has received affected plants from growers in

many different parts of the country. The disease is fairly characteristic and may be easily recognized. The surface of the leaves is almost completely covered with numerous small dead (necrotic) spots (fig. 90), while the remaining leaf tissue is yellowish and the plant is stunted.

Begoniaceae. Begonia sp.

In affected Begonias rings or zoned spots develop on the leaves (fig. 93). The plants are stunted and the flowers are poor.

Compositae.

The following plants belonging to the Compositae are commonly infected: Aster, Zinnia, Dahlia, Chrysanthemum, Calendula, Cineraria, and Lettuce. Of these perhaps the most important is the Dahlia, chiefly because the virus passes into the tubers and is thus not only carried over the winter but may be transported to new districts in the infected tubers. The chief symptom of the disease on Dahlias is the production of concentric rings or wavy lines on the leaves (fig. 90). The disease may be severe on young seedlings but is usually rather mild on older plants.

The Chrysanthemum is another important host because it so often follows on the Tomato crop in the same glasshouse and is thus given the maximum opportunity for infection. There are no very characteristic symptoms of the disease in Chrysanthemums. In general the plant is stunted, the young leaves are twisted and pallid and there may be some mottling with brown spots on leaves and stems.

The Zinnia shows fairly characteristic symptoms; the young leaves present a mottled appearance of dark and light green, and occasionally the mottling consists of numerous faint round spots with a tendency to form rings or zoning (fig. 90).

In affected Asters the central leaves are distorted and show unusually dark green streaks or mottling; the flowers are abnormal in appearance, very small and frequently much distorted. Ring formations have not been observed in this plant.

Cinerarias are very susceptible to infection with the spotted wilt virus which produces a severe disease. Pale yellow spots develop on the leaves and these are followed by browning of the veins and frequently by the death of the plant.

It may perhaps be worth while describing the disease on Lettuces, which are also susceptible and are now often forced in glasshouses. The most serious effect is the destruction of the central or heart leaves, which commences as a kind of rot along the outer edges accompanied by numerous small spots of dead tissue on the inside of the leaves.

Campanulaceae. Campanula.

Specimens of *Campanula pyramidalis* and *Trachelium* sp. affected with the spotted wilt virus have been received at Cambridge. Symptoms in these plants are of the ringspot type, the leaves exhibiting concentric rings or wavy lines and markings (fig. 94). Affected plants are stunted and growth is poor.



FIG. 60. SPOTTED WILT DISEASE.

Abac - Pachira leaf with ring markings

Bch - Zinnia infected

Leaves of *Strophosolen jamaicensis* with
ring and line markings

Leaf of *Tropaeolum* with numerous
spots

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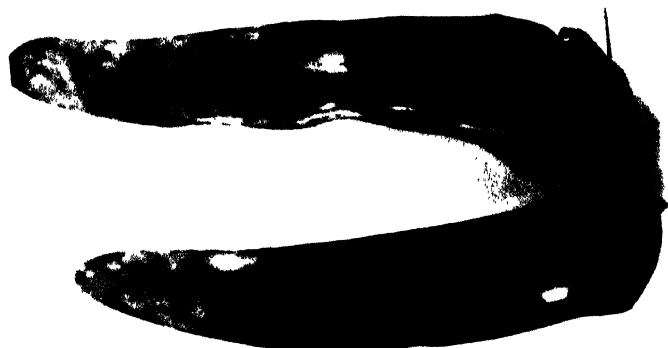


FIG. 92. SPOTTED WILT DISEASE
Leaves of Amaranth showing pale spots and necrotic patches



FIG. 91. --SPOTTED WILT DISEASE
Stock (Matthiola) showing crinkling and distortion
of foliage



FIG. 03. SPOTTED WILT DISEASE
Leaf of Begonia with faint rings



FIG. 04. SPOTTED WILT DISEASE
Leaves of Tracheum showing rings

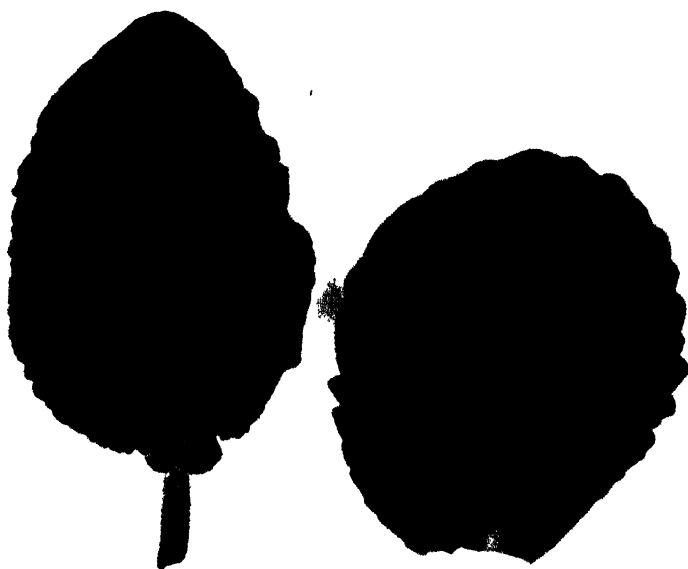


FIG 95 -- SPOTTED WILT DISEASE

Above - Plant of Calceolaria showing large pale blotches

Below.- Leaves of Gloxinia showing large circles and lines following veins.

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Scrophulariaceae. Calceolaria.

The *Calceolaria* is very susceptible to the disease and affected plants have been sent in from a large number of growers; indeed this is one of the plants most frequently received. The symptoms are characteristic and severe. Diseased plants, particularly if long-infected, are stunted with the growing points tending towards a rosette formation. The most outstanding character, however, is the presence of large pale irregular blotches on the leaves which give a curious patchwork effect to the plant (fig. 95). The leaf outline is also distorted and the green tissue between the blotches may be blistered. Frequently accompanying these symptoms is a red or pinkish destruction (necrosis) of the tissues in the neighbourhood of the veins.

Gesneriaceae. Gloxinia.

In *Gloxinia* the chief symptom is the development on the leaves of dark reddish-brown circles and lines following the veins. The circles may be quite large and thick-walled (fig. 95).

MONOCOTYLEDONS.

Araceae. Zantedeschia aethiopica. Arum or Calla Lily.

Arum lilies are very frequently infected by the spotted wilt virus, chiefly because of the fondness of the thrips for the flowers of this plant. Although this disease of arums has probably been causing loss to growers for some years—in one case brought to the writer's notice 200 lilies were infected and had to be destroyed—it was only last year that the trouble was definitely proved by inoculation tests to be due to the spotted wilt virus. The symptoms consist of white spots or streaks generally following the veins of the leaves. Frequently the spots are of a ring-like character and they may be so numerous as almost to cover the leaf (fig. 96). The leaves also may be twisted and the flowers are abnormal in shape.

Amaryllidaceae. Hippeastrum.

The leaves of affected plants show numerous pale yellow or white spots (fig. 92). These spots may be isolated or coalesced into pale patches. Accompanying them are numerous blood-red necrotic spots usually associated with the pale spots, but also running along and destroying the leaf edges. The leaves finally turn yellow and die.

Methods of Control.

The chief methods of combating the spotted wilt disease in glass-houses may be outlined as follows: first, the thrips, which is the main agent of spread of the virus, must be eradicated; and secondly, all diseased or suspected plants *must* be removed and destroyed. Thirdly, whenever possible, *Tomatos* should be grown in a house by themselves

or at least kept out of contact with some of the more susceptible plants like Dahlias, Arum lilies and Calceolarias.

As regards the destruction of the thrips it must be admitted that complete eradication is not an easy matter, but regular fumigation will do much to keep down the numbers of the insect. A good nicotine fumigant is the best to use and for thrips on Arums the Cheshunt Experimental Station recommends powdered naphthalene, grade 16, broadcast over the plants at the rate of 10 ounces to 1000 cubic feet. Then as to the immediate removal of diseased or suspected plants, this must be ruthless. It is of no use to keep a choice specimen which is infected in the hope that it will recover, plants infected with this virus never recover. They may show few symptoms in some cases, but, nevertheless, the infective agent is still there and such plants will continue to spread infection far and near among the healthy plants.

To be forewarned is to be forearmed, and if the grower keeps a careful look-out for symptoms of bronzing among his Tomatos and of rings or ring-like markings on other plants and removes and destroys such plants at once, he will do much towards the eradication of the disease. For it must be remembered that the thrips is not of itself infective and must have a source of infection to feed upon in order to disseminate the virus.

It is of course hardly necessary to add that in no case should the seed or vegetative organs of infected plants be used for propagation.

The foregoing list, by no means complete, of ornamental plants susceptible to the spotted wilt virus will give the reader some idea of the range and widespread nature of this serious virus disease. In reviewing the amount of material infected with the virus of spotted wilt which has been sent in to the writer during the past three years, there can be no doubt that each succeeding year has seen an ever-increasing spread of the virus through the stocks of ornamental plants in this country. Unless some kind of concerted action is taken, ornamental plants which are vegetatively propagated will, in a few years, reach a state of degeneration which cannot fail to react to the disadvantage of the industry.

CALIFORNIAN JOTTINGS.

By Viscountess BYNG OF VIMY.

IN American parlance Pasadena is "A City of Homes," which means there are no factories or business quarters, save shops that serve the inhabitants. I should call it a Garden City *in excelsis*, because there are properties running from fifteen acres in extent down to small plots with little houses, so that all pockets are catered for. There is nowadays no dividing line between Los Angeles with its port of Wilmington, thirty miles from Pasadena, Hollywood, Glendale, Burbank, and various other small towns, so that a lovely piece of country has degenerated into a sprawling network of buildings with no escape from pavements or traffic, though just overhead the Sierra Madre Range beckons alluringly, with 6000-foot Mount Wilson crowned by its world-famed observatory, and, farther afield, the towering snow-crest of San Antonio—or "Old Baldy" as it is familiarly called—stands clear-cut against a blazing sky. I doubt if there is any other place in the world where, as you walk along palm and mimosa shaded roads, you see motors filled, on a Sunday, with ski-ing and tobogganing parties, for it is only a matter of a two-hour drive from this subtropical land to the snow region, where in winter many people spend their Sundays. Built-up area though Pasadena is, it still has a certain beauty, but an architect suddenly dumped down here would wonder if he were sane or mad at the varieties of houses to be seen. Cheek by jowl you find a villa reminiscent of the Norman Shaw period in England, a Tudor farmhouse, Canadian shacks of water-worn rounded stones set in cement, glaringly white painted brick atrocities, reminiscent of Suburbia at its wealthiest and worst, and wooden Colonial houses, with tall columns and deep verandas. But, best suited of all to this land, where Spain has left an indelible impress, are the adobe houses, their walls coloured a deep cream, buff, or a wonderful tone of pink with a good deal of ochre in it, their roofs of warm, dark red tiles, and patios, where, through an archway, or a wrought-iron gate, you glimpse flower-beds gay with colour, or a fountain sunk in the ground and surrounded by blue tiles that look as if a piece of the azure Californian sky had dropped to earth to gladden the eye of man. The Spanish influence remains in the Spanish-Mexican type of people who abound, the thousands of names such as Santa Barbara, San Bernardino, Santa Anita, El Monte, Los Feliz, Santa Ana, Figueroa, and so forth all over the State having a lovely lilt to them that fits with the surrounding lemon and orange groves amid which they exist.

For nearly fifty years Pasadena has been the playground of wealthy Americans who, escaping the rigours of Eastern winters, have built themselves homes, with gardens as varied as the architecture of the houses. Some are just meticulously manicured and barbered green lawns—no other words fit their smugness—stretching down to

the side-walk, others show an owner with a desire to make the most of his patch of ground, and you see beds carpeted with *Primula obconica*, *P. malacoides*, and *P. × kewensis*, Violas, Mesembryanthemums in a riot of colour, Gazanias sitting so close to the ground that their big golden blooms look like a field of Buttercups in June, Stocks, Cinerarias and tall Ranunculus in rainbow hues. Above them rise Orange, Lemon or Grapefruit trees laden with fruits, and a few waxy blooms, though the full flowering time is only just starting (February 20). All the subtropical plants that one sees struggling along on the Riviera are splendid here. Poinsettias grow in great fields to cut for the Christmas market, and for the first time in my life I like these aggressive-looking blooms when they form 12-foot high bushes against the colour-washed adobe houses, or are used in conjunction with a vivid red Pelargonium to form a hedge round Orange groves. Bougainvillea we are spared, I am glad to say, as the quarrelsome magenta colour is the only one known here and does not find much favour. Jessamines white and yellow, Banksian and Cherokee Roses in pink or white, the adorable shell-pink 'Belle of Portugal' and 'Gold of Ophir' clothe the fences, while under the window of my sitting-room at the hotel is a huge plant of *Solandra guttata* in full glory, its golden-bronze cup-shaped flowers streaked with wine colour and emitting a faint scent of Apricots; but, alas, the 'Copo de Oro' is useless for cutting! Bignonias of every shade are plentiful, on the houses and pergolas Wistarias run riot, while *Ficus repens* replaces Ivy on the walls.

Many of the smaller places in Pasadena are devoid of fences or hedges, and their lawns stretch to the side-walks, so that you have the illusion of being actually in the gardens—an illusion rudely shattered when a gardener turns on the hidden sprinklers in the grass and you get a shower-bath that sends you hopping on to the roadway crowded with motors travelling at top speed. The roads are planted with good shade trees—a necessary addition to life here, for even in winter the sun can be fierce, and the heat rising from the pavements makes exercise an effort. For this shading they use chiefly the following trees: Palms—*Cocos plumosa* and *C. flexuosa*, *Washingtonia robusta*, *W. sonora* and *W. filifera*, which is indigenous—feathery Jacarandas, Pepper trees, India-rubber trees, Carobs, with their bronze bean-pods, Mimosa in a wonderful succession of golden glory, *Eucalyptus Globulus*, *E. ficifolia*, with varying shades of red and pink blooms, *Cinnamomum Camphorum*, which at present is shedding last year's foliage in rich shades of gold and red, while the new shoots are a lovely pale green tipped with rose. Olives are used as ornamental garden trees, and great orchards of them are grown in the open country. Oranges, Lemons, Kumquats are everywhere, and a lovely form of *Betula alba pendula*, whose leafless branches look as if they had been dusted with cinnamon powder and with stems which seem even whiter than *B. papyrifera alba*. Of shrubs there are wonderfully florescent masses of Japanese Cherries and Peaches, especially a variegated double one which has deep rose, pale pink and almost white blooms on it. Nobody has a name for it, even nurserymen, and it is not a grafted tree.

I have never, so far as I can remember, seen this particular one at home. *Erica melanthera* makes 15-foot bushes and is a mass of pale pink bloom, but unfortunately the Ceanothuses, being native, are neglected, and the few one sees are by no means the best colour—yet another case of the prophet in his own country! *Strelitzia reginae* is a great favourite, rising from a groundwork of Primulas, and I know of wonderful 20–25-foot high plants of *S. Nicholai*, of which the blooms, like *reginae*, make an admirable house decoration, provided you cut the stem, give fresh water and remove dead flowers. In this way I have had them in bloom for over a fortnight. But though one writes glibly of these masses of floral glories in California, gardeners and farmers by no means have it all their own way. In winter the Citrus growers live through anxious times when Mount Wilson Observatory sends out a frost warning, for it is easy to have the year's crop ruined by 6° to 8° of frost one night, so that the moment the notice comes on go the "Smudges"—oil stoves—which send forth a protecting cloud of vile smoke which will hang about for days on end, hiding the view and reminding one forcibly of a London fog. Besides frost there are innumerable insect pests which do not get winter-killed; flies in every shade of colour, so far as I could make out from Mr. HERTRICH—mealy-bug, scale, and so on *ad infinitum*—until the Government came to the rescue and bred ladybirds, which are sold to growers, so that with twenty-five of these busy little people to each Orange or Lemon tree the pests are destroyed and a good crop ensured. Of course in this, as in all other questions, lies the snag of over-production, and millions of Oranges are destroyed rather than that the price should drop—a thing that revolts one, since it is pandering to the middleman instead of letting the price fall in order that the very poorest can give their children the fruit which is so good for them. However, it is the same tale the world over, the grower gets but little, the consumer pays dearly, and the middleman waxes fat and shines.

The average Pasadena garden is rather elementary and reminds one of those on the Riviera, planned to make a good showing for a short period, but to walkers, like ourselves, they are a refreshment, tied down as one is to the everlasting pavements! Walking is an incomprehensible thing to the average American, and to their way of thinking you walk either because you have not got a car or because you are a mildly mental case. I remember a small boy in Canada who, seeing us take our daily walks around Rockcliffe, said "Mummy, can't the Governor-General afford a car?" It is much the same here, and kindly strangers are always offering us a lift. A friend of mine said once while motoring with her husband in a country district they saw a man walking, and when they reached him found a placard on his back, "I am walking, thank you." On our daily prowls we have made friends with many of the gardeners, who invite us not only into the garden, but frequently to the house as well. It is rather startling to find oneself seated in the drawing-room of a total stranger who is away in New York or somewhere East. But the gardener writes and tells

his employer what he has done, and then comes a letter making one free of the place, which is typical of the American attitude of friendliness. The smaller gardens do not run to a permanent employee, so the jobbing gardener is much to the fore, and varies from the urbane, flat-faced Chink to the busy little Jap, the gum-chewing, square-jawed American, and the blonde Scandinavian. They generally come to work in cars that beggar description. As a rule the car is devoid of a bonnet and all paint, the mudguards have long ago vanished, and horsehair shows through the tattered leather of the seats ; on the front bumper is a mowing machine tied with much knotted pieces of rope, long-handled pruners and a ladder protrude dangerously fore and aft on the running-board, and the back is piled up with water-cans, sacks of fertilizer, bamboo brooms, matting, rakes, canes, spades, forks, trowels, and every conceivable weapon of the gardener's trade. The tree expert runs the jobbing gardener close, for trees out here need an enormous amount of attention ; so round goes another but less derelict car, also piled with implements plus sacks of cement and "Tree Doctor" painted on it in large white letters. Of the permanently employed gardeners in Pasadena a large percentage are British born and greet one with joy, and then follows a long chat about the Old Country where they still live, in thought and heart, though many have been here forty years or more, without ever going back, or any hope of affording so costly a trip.

Of the big gardens there are many charming examples. Some are Italian in style and have hedges of Myrtle or Yew, sunk marble fountains and lawns with *Eugenia australis* bushes 15 feet or more in height, trimmed as we trim Box, but the *Eugenia* retains a lovely crimson tinge where the young shoots keep coming on. In one such garden Mr. Arliss filmed scenes in several of his pictures, and it certainly lends itself admirably to such a thing. The other day Miss Mae West also was granted permission to have some "shots" made there, and the owner was considerably startled when the company arrived plus parrots, cockatoos, monkeys and a brace of full-grown lions seated with the keeper in a motor.

I have seen good groupings of Primulas associated with deep rose-red Cyclamens under Ilexes and one wide border of large-leaved Saxifrages, *Primula obconica*, *P. malacoides* and *P. × kewensis*, with a background of Antirrhinums, Stocks on 27-inch stems, and Cinerarias—a queer mixture that one hardly associates together. As for the Japanese flower booths at every available corner they thrill me, for never have I seen such a mass of colour or such an astounding variety of blossoms—Lilies, Callas, Stocks like young trees in growth, Gladioli, Ranunculus, Mimosa sprays, Delphiniums, Roses, Violets, Gardenias, Poinsettias, Freesias, Strelitzias, Narcissi, St. Brigid Anemones, Iceland Poppies, and a host of others that I forgot to memorize. The greengrocers' stalls are equally prodigal, with great sloping wooden trays piled high with Oranges, Lemons, and other fruits, probably two or three hundred on a tray. Navel Oranges cost 25 cents for seven dozen, though a few weeks ago you could get the same number

for 15 cents. Besides Oranges and Lemons are heaped masses of Grapefruit, Avocado Pears, Tangerines, Apples, Pears, Pine-apples, Bananas, all forming a wonderful blend of colour that carries one's eye on to the vegetables alongside them. Mountains of ivory-white green-flushed Iceberg Lettuces, bundles of Asparagus, Green Peas, French Beans, Carrots, Chicory, Onions, Egg Plant, Pimentos, Celery, which despite the lack of frost is the crispest I have eaten anywhere, while the sober hues of Sweet Potatos and 'Squashes' tone down the general blaze of colour. These things are so marvellously displayed that nobody can resist them, and the American housewife appreciates the value of vegetables in the family's diet and uses them in ways that English cooks never dream of doing. The salads are delicious, and one of the best I tasted was at Mary Pickford's, consisting of fruits of all kinds, including Avocado Pears and green vegetables, with a very simple dressing. Hostesses never omit a salad course at any meal they bid you to, so it is no wonder the greengrocery stores, with their open fronts, are some of the most attractive things in Southern California.

Thanks to the Japanese and Chinese cultivators the country is abundantly supplied with vegetables. As one travels by car along the wonderful highways that in many cases can take four to five cars abreast, one passes acre after acre heavily cropped with vegetables, where whole families work, from tiny children to grand-parents. There is no question of any eight-hour day there!! From the first peep of dawn to the hour when the light has completely faded these industrious little folk squat over the seedlings, thinning, watering, tending with meticulous care the rows and rows of tiny plants. The ground is admirably tilled and fertilized, unlike the fashion in which farmers in neighbouring states have scratched up the soil, wrenched from it a temporary harvest and put nothing back into it, with the result that whirling dust-storms have torn the light soil about, scattered it far and wide, bringing death and destruction to man and beast in the fearful storms that have devastated vast areas of what should, with due care, have been fertile farmland. The Oriental is too far-seeing and too thrifty to commit such a mistake, and he reaps the reward of his labours in the masses of magnificent vegetables he sells with good profit either in his own roadside booth or to the American store-keeper who displays them with such admirable taste that they are a joy to behold.

Now that leisured Americans are becoming "garden conscious" in the West, nursery gardeners have sprung up, big and small, all along the highways, and I have never seen a better display of Azaleas and Camellias than that afforded by Coolidge's nursery; they also have a superb strain of Hibiscus in deep apricot, crimson and pink. But I can imagine the faces of horror with which English growers would contemplate the rows and rows of old and rusty or new kerosene and jam tins in which plants are raised and exposed for sale. They are not pretty, but growers tell me that economically they answer, for they last longer than pots, and retain moisture better in this dry, hot climate. Anyhow, I must say the plants are wonderfully healthy housed in

these unattractive cans. Of course the nurseries grow mostly foreign stuff, South African or English, because Americans do not yet appreciate their native flora, though in the last few years, thanks to a vigorous Press campaign, they are becoming aware of the many Californian wildlings within their reach and are now flocking in crowds to see them. Another sign of the American interest in flowers are the Garden Clubs springing up on all sides. I was invited to attend one such meeting in Pasadena, where I saw the most ingenious method of displaying small exhibits of floral arrangement, made of black lacquered wood divided into sections with gilt edges to relieve the black. Each vase has its niche, and the result, as regards the flowers, is really admirable, as you can understand by the illustration (fig. 97). I should like to see it adopted at home for small exhibits, because it saves ground space by its height.

If, as I said before, the average gardens are of a slightly elementary character, this by no means applies to the one at the Huntington Museum, where Mr. HERTRICH's wizardry has transformed an unkempt ranch into a paradise. Of course the Succulent Garden must be given the palm, since it is world-famed and has the biggest collection of these plants in existence, and, though personally I am not "succulent-minded," I appreciate their beauties and the marvellous value of this garden to students. But Succulents, of all plants, need the proper environment, and that they get in this particular garden, which lies on a hot, dry slope with perfect drainage and the gravelly sandy soil these queer plants need, come they from India, South America, Australia, the Canary Islands or South Africa. The high plateau on which the Museum stands slopes sharply to the south, and to reach the Succulent Garden you walk through a fine collection of Palms set in a green lawn. A drive divides this from the other side of the bank, which is planted with Aloes, *Candelabrum*, *Marlotii*, *ferox*, *supralaevis*, *Salm-Dyckiana*, *arborescens*, *horrida*, and interesting hybrids that Mr. HERTRICH has raised. These plants form a wonderfully decorative background to the garden, and in January, when we first arrived, were a glowing mass of orange, flame and crimson spikes. This planting runs down to the lower level and a series of rocky pockets, which contain every kind of uncouth plant—at least so they seem to me. There are mounds of grey-coloured *Neomammillarias* from Mexico, *Echinocactus Grusonii* (Mexico), and others of the same family; big bushes, if one may call them so, of *Cereus xanthocarpus* (Paraguay); savage-looking mounds of *Ferocactus latispinus*, with wine-coloured blooms just coming out now (February); Sedums innumerable, of which the most attractive, to my mind, was the pink-tipped grey-foliaged *Sedum Treleasei*; *Kleinia mandralicea*, also grey-foliaged, from the Canary Islands, *Euphorbia antiquorum* (India), *Makaecrocereus eruca*, well named out here 'Creeping Devil Cactus,' with its wide-flung prickly branches (Lower California); *Aeonium hierrense*, a house-leek from the Canary Islands, makes a fine splash of colour with its heads of golden bloom; *Crassula lycopodioides* (South Africa and Australia); *Mesembryanthemum Alstonii* (South Africa), with lovely deep red flowers



FIG. 66 SPOTTED WILT DISEASE

Leaf of Arum Lily with numerous white spots and occasional ring markings.

[To face p. 316.



FIG 97.—SMALL EXHIBITS AT A PASADENA SHOW.



FIG. 68. ACACIA DIFFUSA, PROSTRATE FORM.

(p. 327)



FIG. 99 -- MYGINDA DISTICHA.
(p. 327.)

[To face p. 317.

that catch one's eye from quite a long distance. *Opuntia spinosa* (New Mexico) is a 6-foot mass of small yellow blooms, while *Sedum praealtum* (Mexico) is also at its best, as are the Kalanchoes from South Africa. There are some most unpleasing, looking snake-like climbers trained up the trees—*Selinicereus Macdonaldiae* and *S. pteranthus*, both somewhat redeemed by the rose-red fruits that birds love, *Hylocereus undulatus*, *H. Harrisii* and *H. tortuosus*, well named, for it grows sprawling up the trunk of a Palm tree. *Cephalocereus leucocephalus* (Mexico), with lavender-pink blooms, is now in flower; *C. senilis* (East Mexico), a plant which very rarely blooms has done so here; and here also are *C. polylophus* (north-east Mexico) and *Cereus horridus* (South America) which has its white blooms fringed with pink.

Among taller plants are two huge *Carnegiea gigantea*, about 30 feet high, which came, not long ago, from the driest belt in Arizona. I think even Mr. HERTRICH's stout heart quailed when they appeared at the height of the rainy season—for it can deluge in California when it chooses to do so—and here were these prickly awkward giants who would not tolerate a drop of wet on their toes. Now, Carnegias are not exactly the sort of thing you carry round a garden till you find a nice corner for them, and, moreover, the Succulent Garden has not got many gaps. However, undefeated as ever, Mr. HERTRICH devised an admirable plan. He planted his giants in the hottest, most arid spot available and built a 2-foot-square greenhouse round their base, putting up the cracks and joints so carefully that no drop, even of Californian rain, could penetrate. To-day (February 26) the greenhouses are being opened up, and I never saw a more unpromising looking root than was revealed in this operation. Certainly to my ignorance of such plants, it seemed impossible that these desiccated roots can have any life in them, for they showed no sign of fresh growth after their pruning back on replanting. I hope, however, for Mr. HERTRICH's sake, his huge and ugly ducklings will survive.

In its native habitat this Goliath of the Cactus family is amazingly prolific, and a botanist once counted 1980 seeds in the ovary of a single pistil and, being in arithmetical mood, 3482 stamens in a single bloom. But birds are avid of the seeds, and so the Carnegie is never seen in vast groves as are the Joshua trees. Taller plants that appeal far more to me are the great Aloes, *arborescens* and *speciosa* (South Africa), *Agave attenuata* (Mexico), and *A. huachuensis*, in which the offset frequently blooms before the parent plant.

This is only a meagre account of the wonders of the collection at the Huntington Gardens, but space forbids my trespassing further in this direction, besides it would need the erudition of Mr. HERTRICH to do justice to the wealth of plants under his care and to explain them in detail; but I hope that any reader of these notes who happens to be going to California will be moved by them to visit the wonders of this vast collection—I believe the biggest and most complete in the world.

(To be continued.)

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

Acer monspessulanum, red-fruited form. A.M. May 21, 1935. From Douglas Clarke, Esq., Cranbrook. The Montpelier Maple is a large shrub or small tree with shining, three-lobed leaves $2\frac{1}{2}$ inches across. In this variety the narrow, winged fruits, which are borne in short racemes of five or six, are of a bright red colour.

Anemone obtusiloba patula. A.M. May 21, 1935. From the Donard Nursery Co., Newcastle, Co. Down. The leaves of this variety resemble those of the bulbous Buttercup, and form a basal cluster which gives rise to numerous spreading leafy axillary shoots each bearing one or two lavender-blue flowers $1\frac{1}{2}$ inch in diameter, with a central tuft of green anthers. Introduced from Burma to Glasnevin in 1913.

Ansellia nilotica var. splendens. A.M. May 21, 1935. In this variety the flowers are more heavily marked with crimson-red, and the colour is more intense than in the type. Shown by M. L. Wells, Esq., Chiddingfold, Surrey.

Begonia 'A. R. Flint.' A.M. May 21, 1935. From Messrs. Blackmore & Langdon, Bath. A large double, bright cerise-pink, tuberous-rooted variety with flowers measuring 5 inches across.

Begonia 'Everest.' A.M. May 21, 1935. From Messrs. Blackmore & Langdon. A very large double, pure white, tuberous-rooted variety. The edges of the petals are slightly waved and the flowers measure 6 inches across.

Begonia 'Lady Lillford.' A.M. May 21, 1935. From Messrs. Blackmore & Langdon. A pale yellow, double, tuberous-rooted variety with flowers measuring $4\frac{1}{2}$ inches across.

Berberis montana. A.M. May 21, 1935. From Lt.-Col. L. C. R. Messel, O.B.E., Handcross. This attractive species was collected by H. F. Comber at altitudes of 3000-6000 feet in the Argentine Andes, where it reaches a height of 15 feet. The branches are set with clusters of entire, obovate leaves $\frac{3}{4}$ inch long, and large golden-yellow flowers borne singly or in pairs.

Campanula tridentata. A.M. May 21, 1935. From G. P. Baker, Esq., Sevenoaks. A very ornamental Armenian species collected by E. K. Balls, suitable for the rock garden and alpine house. From a cluster of linear-spathulate, obscurely toothed leaves arise the slender flower-stalks, each bearing a large, solitary, blue flower with five spreading violet lobes.

Ceanothus prostratus. A.M. April 24, 1935. From W. Bentley, Esq., Burghclere, Hants. An uncommon dwarf shrub for the rock garden or alpine house. The opposite leaves are leathery and dark green, with a few spiny teeth. The blue or purplish flowers are carried

in erect clusters above the foliage. Protection is required while the plant is young.

Ceanothus thyrsiflorus. A.M. April 24, 1935. From T. Hay, Esq., Hyde Park, London, W. 2. An attractive species, which in California forms a slender tree 20 feet high. The dark green leaves are ovate, rounded or slightly cordate at the base, serrate, sparingly hairy with three prominent ribs beneath. The grey-blue flowers are freely produced in pyramidal panicles 3 inches long at the ends of short axillary growths. Probably most satisfactory in the shelter afforded by a wall.

Cymbidium × '**Balkis.**' F.C.C. May 21, 1935. (*C.* × *Alexanderi* × *C.* × '*Rosanna.*') The spike bore five flowers in which the broad segments are blush-white, while the round labellum has a pink margin and some reddish spots. Exhibited by Lionel de Rothschild, Esq., Exbury.

Cymbidium × '**Cremona**' var. '**Black Prince.**' F.C.C. May 21, 1935. The spike bore eight flowers, buff-yellow with red lines and shading. The front lobe of the labellum has a bold crimson zone. Shown by Messrs. McBean, Cooksbridge.

Cymbidium × '**Dora**' var. '**Golden Empress.**' A.M. May 21, 1935. The spike carried seven flowers, which are greenish with brown veins, while the labellum has a crimson zone on the apex of the front lobe. (*C.* × '*Bullfinch*' × *C.* × '*Wheatear.*') Exhibited by Messrs. H. G. Alexander, Tetbury.

Cymbidium × '**Olympus**' var. '**Monarch.**' A.M. May 21, 1935. The spike carried nine white flowers, the labellum mottled with rose. (*C.* × *Alexanderi* × *C.* × '*Vesta.*') From Messrs. H. G. Alexander.

Cymbidium × '**Profusion**' var. *violaceum*. A.M. May 21, 1935. The many flowers were of violet-rose colour, marked with lines of a deeper tint, the labellum spotted with red. (*C.* × '*Ceres*' × *C.* × '*Vesta.*') From Messrs. McBean.

Cymbidium × '**Swallow,**' Exbury var. A.M. May 21, 1935. The spike bore seven flowers of clear straw-yellow colour, the front lobe of the labellum lightly spotted with red. (*C.* × *Alexanderi* × *C.* × *Pauwelsii.*) From Lionel de Rothschild, Esq.

Daphne × **Burkwoodii.** A.M. May 21, 1935. From Albert Burkwood, Esq., Poole. An attractive hybrid raised by the exhibitor, who gives the parentage as *D. caucasicum* × *D. Cneorum*. It forms a neat, regularly branched bush with plenty of small, spatulate leaves and numerous heads of fragrant, blush-white flowers tinted externally with rose-purple.

Dendrobium moschatum, Gatton Park var. A.M. May 21, 1935. A beautiful form of the species, the colour being clear apricot-yellow. There are a few reddish lines on the inside of the labellum. From Sir Jeremiah Colman, Bt.

Echium Bourgaeanum. A.M. May 21, 1935. From Viscountess Byng of Vimy, Thorpe-le-Soken. A striking biennial plant which forms, in its first season of growth, a large rosette of long, silvery-

green leaves. The massive columnar inflorescence which arises later is made up of very numerous, cymose sprays of salmon-mauve flowers. The plant shown was in a pot and about 3 feet in height.

Enkianthus chinensis. A.M. May 21, 1935. From G. H. Johnstone, Esq., Trewithen, Cornwall. A pretty shrub collected in China by Forrest (No. 27402). The oblanceolate leaves, which have red-tinged petioles, are clustered at the ends of the branchlets. The pendent, campanulate flowers are cream-coloured with stripes of crimson running to the rounded tips of the lobes.

Iris 'Susiana.' A.M. May 8, 1935. From C. W. Christie-Miller, Esq., Swyncombe House, Swyncombe. Belonging to the *Oncocyclus* section; was named by Linnæus in 1753. A vigorous grower with large yellowish-green foliage 15 inches high and over 1 inch broad; flower stems 15-18 inches high. Flowers large, veined and dotted with purplish-black on a grey ground, standards paler than the falls. Commonly known as the 'Mourning Iris.'

Isotydæa × 'Violette.' A.M. May 21, 1935. From Major William Van de Weyer, Dorchester. A very handsome and interesting plant for the warm greenhouse. It is of bigeneric origin, the parents being *Isoloma bogotense* and *Tydæa* 'Sultan,' and was raised by the exhibitor. The pot plant shown was 3 feet high, unbranched, with opposite, ovate-lanceolate, downy, light green leaves. The flowers are tubular, 2 inches long, rosy-scarlet; the inside of the five spreading lobes is sulphur-yellow, spotted with crimson.

Odontoglossum × 'Belus' var. 'Leviathan.' F.C.C. May 8, 1935. The spike bore five flowers which are the largest that have yet been seen in a garden-raised *Odontoglossum*. The segments are all marked with reddish-purple. The result of crossing *crispum* with 'Marcella.' From Messrs. Charlesworth, Haywards Heath.

Odontoglossum crispum var. 'Rellance.' F.C.C. May 21, 1935. A home-raised form of this well-known species. The spike carried ten flowers, white with rose flushing on the sepals, while the labellum has a few reddish spots. From Messrs. Charlesworth.

Odontoglossum × 'Mercurians' var. Perfectum. A.M. May 21, 1935. The spike bore ten well-formed flowers of crimson-red colour, the labellum having a broad white border. (*O.* × 'crispo-Solon' × *O.* × 'Rosina.') From N. Prinsep, Esq., Pevensey Bay, Sussex.

Odontonia × 'Theodora.' The spike bore four flowers, reddish-crimson, the large labellum lighter in colour at the margin, and with a yellow crest. (*Odontonia* × 'Nestor' × *Odontoglossum* × 'Purple Queen.') From Messrs. Charlesworth.

Olearia floribunda. A.M. May 21, 1935. From Lt.-Col. L. C. R. Messel, O.B.E. An erect shrub from Tasmania, collected by H. F. Comber, of Ericoid habit, with very small, green leaves with reflexed margins and numerous tiny, four-rayed flower-heads clustered along the lateral twigs. Some shelter is recommended.

Paeonia 'Crimson Globe.' A.M. May 21, 1935. From Messrs. Prichard, Christchurch. A good herbaceous *Pæony* raised by the

exhibitors from *P. officinalis* × *P. atrosanguinea*. The foliage is large and handsome, while the varietal name well describes the flower.

Paeonia emodl. A.M. May 21, 1935. From Major F. C. Stern, Goring-by-Sea. A herbaceous species of slender growth from the Himalaya. The tall stems bear large, pinnatifid leaves and two or three single white flowers with golden stamens.

Paeonia Moutan 'Silver Pink.' A.M. May 21, 1935. From Major F. C. Stern. A very lovely Tree Pæony with flowers 8 inches across. The petals are about ten in number, obovate, concave, unevenly serrate, light rose. The central tuft of crimson, golden-anthered stamens adds to the beauty of the flower.

Paeonia 'Redwood.' A.M. May 21, 1935. From Major F. C. Stern. A very pretty hybrid Pæony raised in New York from the cross *P. Woodwardii* × *P. tenuifolia*. The deep green foliage is finely cut, and the widely expanded flowers have undulate petals of intense crimson, contrasting effectively with the golden stamens.

Paeonia tomentosa. A.M. May 8, 1935. From R. G. Berkeley, Esq., Warley Place, Brentwood. A handsome herbaceous species from the hinterland of the southern Caspian Sea. The large leaves are biternate with obovate, glossy green segments paler beneath. The cup-shaped flowers are 4-5 inches across, with five rounded, concave, white or creamy-white petals and numerous crimson, golden-tipped stamens. The taxonomic status of this species is discussed in the text accompanying t. 9249 of the Botanical Magazine.

Prunus serrulata 'Hörinjl.' A.M. April 24, 1935. From Collingwood Ingram, Esq., Benenden. A very handsome Japanese Cherry with large flowers, composed of twelve to fifteen overlapping, notched petals of pale rose-pink, arranged in long-stalked clusters of four or five.

Ranunculus asiaticus, orange form. A.M. May 8, 1935. From G. P. Baker, Esq., V.M.H., Sevenoaks. Many forms of *Ranunculus asiaticus*, both single and double, have long been in cultivation in British gardens, and many have been figured in horticultural journals. The present plant is a beautiful single orange form collected in Cyprus by the exhibitor, whose pure white form from Crete received the A.M. on May 6, 1930. Winter protection is recommended.

Ranunculus × Arendsli. A.M. May 21, 1935. From Messrs. Elliott, Stevenage. The parentage of this hybrid is stated to be *R. amplexicaulis* × *R. gramineus*. The leaves, which are mostly radical, are 3 inches long, linear-lanceolate and somewhat glaucous. The 8-inch stalks each bear two or three large, pale yellow flowers.

Rhododendron 'Blue Diamond.' A.M. April 30, 1935, as a hardy flowering shrub for the rock garden or woodland. Shown by J. J. Crosfield, Esq., Embley Park, Romsey, Hants. This hybrid—(*R. intricatum* × *R. fastigiatum*) × *R. Augustinii*—was raised by the exhibitor in 1932. The small leaves, which are evenly disposed on the branches, are elliptic-oblong, dark green above, pale green below, lepidote on both surfaces. Inflorescence compact, of 4 or 5 flowers; corollas rotate,

4-5 cm. across, deep purplish-blue, scaly outside; filaments erect, white hairy at the base, subequal to the style; pedicels light green and densely scaly like the small calyx.

Rhododendron 'Bow Bells.' A.M. May 21, 1935, as a hardy flowering shrub. Shown by Lionel de Rothschild, Esq., Exbury, Southampton. *R. Williamsianum* × *R. 'Corona.'* An openly branched shrub with bright red young shoots. Leaves like those of *R. Williamsianum*, ovate, mucronate, retuse at the base, dull green above, paler below. Flowers 6-8 in a loose terminal inflorescence, borne on long reddish pedicels; corollas campanulate, about 5 cm. across, bright pink, paler towards the lobes, the buds a deep rich cerise.

Rhododendron Broughtonii aureum. F.C.C. May 21, 1935, as a hardy flowering shrub for the open garden or cold house. Shown by Dame Alice Godman, South Lodge, Horsham, Sussex. A very free-flowering shrub with downy, chestnut-brown branches. Leaves elliptic, acute, about 7-11 cm. long and 3-4 cm. broad, dark green above, paler below. Flowers in compact globose terminal trusses which are 12-13 cm. in diameter; calyx small, pale green and downy like the pedicels; corolla wide-spreading from a short funnel-shaped tube, 6.5 cm. across, soft yellow with orange spots at the back within; stamens hairy in the lower third, exceeded by the glabrous style, which, like the stamens, is the same colour as the corolla.

Rhododendron calostrotum. A.M. May 8, 1935, as a hardy flowering shrub. Shown by Lt.-Col. L. C. R. Messel, O.B.E., Nymans, Handcross, Sussex (Forrest 27065). A dwarf plant, up to 18 cm. high with erect branches. The plant shown covered about 1½ sq. ft. and was completely smothered with flowers. Leaves borne towards the ends of the branches, small, oval, acute; the young leaves glaucous-green above, almost white below, scaly on both sides and ciliate along the margins, becoming darker and buff-coloured below with age. Flowers in pairs; pedicels 4 cm. long, stout, stiffly erect, reddish and conspicuously white glandular; calyx about 6 mm. long, glaucous, lepidote and ciliate; corollas rotate, 4 cm. across, deep rosy-mauve to magenta with darker spots at the back within, and lepidote and pubescent outside; style reddish, about 1.7 cm. long, exceeding the spreading filaments.

Rhododendron 'Caroline Whitner.' A.M. May 21, 1935, as a hardy flowering shrub. Shown by Lady Loder, Leonardslee, Horsham, Sussex. This is a hybrid from *R. Halopeanum Loderi* × *R. Loderi* var. 'Sir Edmund' raised by the exhibitor in 1927. Leaves oblong, obtuse at the base and apex, dark green above, light green below, 18-23 cm. long including the dark red pedicels. Inflorescence a loose shapely truss of 13 flowers, about 27 cm. across; corolla funnel-shaped, wide-spread, 10-12 cm. across, of a delicate pink colour.

Rhododendron concatenans. F.C.C. May 8, 1935, as a hardy flowering shrub. Shown by Lt.-Col. L. C. R. Messel, O.B.E., Nymans,

Handcross, Sussex. This new species (K.W. 5874) has erect, dark reddish-brown branches, with foliage towards their ends. Leaves oval to elliptic, 4·5–7 cm. long and 2–3 cm. wide, dark green above, glaucous and greyish-purple below, covered with brownish scales; petioles short and stout, pale green, conspicuously brown-lepidote beneath. Flowers 5–6 at apex of branches, laxly spreading, borne on pedicels which are 1–1·5 cm. long and glaucous, densely green-lepidote like the calyx; corolla tubular to funnel-shaped, with the lobes somewhat spreading, about 3·5 cm. long and 4–4·5 cm. across, rather fleshy, apricot, faintly flushed rose and somewhat primrose outside; stamens included, filaments hairy in the lower third; ovary glaucous and densely lepidote; style finely pubescent at base, stout, as long as the corolla.

Rhododendron 'Coreta.' F.C.C. April 30, 1935, as a hardy flowering plant for general garden use. Shown by Lord Aberconway, Bodnant, N. Wales. This is a magnificent hybrid between *R. Loderi* and *R. Kingianum*, with large leaves whose blades are oval, 11–19 cm. long, 5–8·5 cm. wide, dark green above, bright light green below, borne on stout petioles which are 3–4 cm. long. Truss large, compact and well formed, about 16 cm. in diameter; corollas about 6 cm. long and 8·5 cm. across, tubular-funnel-shaped with spreading emarginate slightly crisped lobes, rather fleshy and of a deep crimson-scarlet colour.

Rhododendron crinigerum. A.M. April 30, 1935, as a hardy flowering shrub. Shown by Lionel de Rothschild, Esq. Branches stout, very viscid with long-stalked glands; perules persistent. Leaves oblong to oblanceolate, acuminate, base obtuse, variable in size, 8–15 cm. long including the petiole which is 0·8–1·8 cm. long and densely covered with long-stalked glands, 2·2–4·5 cm. wide, dark green and somewhat bullate above, clad with a dense buff-coloured felt below. Flowers in globose or rather flat-topped trusses which are about 11 cm. in diameter; pedicels 3 cm. long, densely white-glandular; calyx 8–10 mm. long, light green, densely glandular; corolla campanulate, about 3 cm. long and 4 cm. across, pale pink with darker lines and spots outside, spotted and with an intense dark red blotch at the base within; filaments erect, white, pubescent at the base, exceeded by the glandular style.

Rhododendron Davidsonianum (pink form). A.M. April 30, 1935, as a hardy flowering plant. Shown by Lord Aberconway. A shrub with the leaves borne towards the ends of the erect branches. Leaves elliptic, acute and mucronate, cuneate to rounded at the base, about 5–6·5 cm. long including the short petiole, 1·5–2 cm. wide, light green and lepidote above, paler and densely covered with brownish scales below. Inflorescence a rather open flat-topped truss of about 7 flowers; pedicels flushed pale red-buff, scaly like the small, obsoletely lobed and ciliate calyx; corollas rotate, 4·5–5 cm. across, tube narrow funnel-shaped about 1·5 cm. long, lobes unequal, the 3 upper spotted red-brown on the inside, otherwise a pure pale

rose ; stamens erect, white flushed rose, white pubescent at the base, subequal to the style.

Rhododendron deleense. A.M. April 30, 1935, as a flowering plant for the rock garden (hardy in the south). Shown by Lord Swaythling, Townhill Park, Southampton. This is a member of the Boothii series, and was introduced by Captain Kingdon Ward in 1926. An openly branched shrub about 50 cm. high ; leaves aggregated towards the ends of the branches, oblong-elliptic, about 7-8 cm. long and 2.5 cm. wide, dark green above, glaucous and densely covered with brown scales below. Flowers 7-9 in a lax terminal inflorescence ; calyx reddish-green, large, lobes oblong-elliptic, rounded, spreading ; corolla magenta-pink, about 2.5 cm. long and 3.5-4 cm. across ; pedicels about 2.5 cm. long, dark reddish-brown and scaly.

Rhododendron fletolacteum, Ward's var. (K.W. 4509). F.C.C. May 21, 1935, as a hardy flowering shrub for the woodland. Shown by J. J. Crosfield, Esq., Embley Park, Romsey, Hants. Branches stout, white tomentose. Leaves large, aggregated below the inflorescence ; blades up to 33 cm. long and 15.5 cm. wide, oblanceolate to elliptic, coriaceous, dark green and shining with the venation impressed above, brown woolly tomentose below ; petioles stout, white tomentose, up to 7 cm. long. Inflorescence a compact globose truss, about 18 cm. in diameter ; pedicels stout, white tomentose like the minute calyx ; corolla tubular with spreading lobes, 5-6 cm. long and 5.5 to 7 cm. across, white with a deep crimson blotch at the base within ; stamens white, glabrous, exceeded by the creamy-white stout glabrous style ; stigmas orange ; ovary white tomentose.

Rhododendron 'Fire Glow.' A.M. May 21, 1935, as a hardy flowering shrub for the woodland. Raised from the cross (*R. 'H. M. Arderne' × R. Aucklandii roseum superbum*) × *R. Griersonianum* in 1929 by the exhibitor, J. J. Crosfield, Esq. Young branches stout and white glandular. Leaves very variable in size, up to 20 cm. long including the petiole, 5 cm. wide, oblong to oblong-lanceolate, acute, rounded at the base, dull green above, glaucous below but covered at first by a very thin brownish tomentum which rubs off easily. Flowers 8-10 in a loose truss ; pedicels stout erect, 3.5-4.5 cm. long, brownish above, conspicuously white tomentose ; calyx reddish, tomentose like the pedicels ; corollas funnel-shaped with the lobes suberect to spreading, about 6 cm. long and 7.5 cm. across, white pubescent outside, deep scarlet, particularly fine when seen in the light and almost the same colour as *R. Griersonianum* ; stamens red and pubescent, exceeded by the stout red style which is densely white pubescent its whole length.

Rhododendron 'Jubilee Queen.' A.M. May 8, 1935, as a hardy flowering plant. Raised from *R. × Loderi Venus × R. × 'Rose du Barri'* and shown by Lady Loder, Leonardslee, Horsham, Sussex. Leaves large, the blades 18-21 cm. long and 6.5-8 cm. wide, dark green above, paler below ; petioles 5 cm. long. Flowers 11, in a

shapely truss about 20 cm. long and about as much in diameter ; delicately scented ; pedicels 3·5-5 cm. long, light green, red glandular ; corolla funnel-shaped, wide-spreading, about 12 cm. across, lobes crisped and somewhat reflexed, pure white with the apices of the lobes tinged rose at first ; style very pale green, red glandular.

Rhododendron megeratum. A.M. April 30, 1935, as a hardy flowering shrub for the rock garden. Shown by Lord Swaythling, and grown from seed introduced in 1926 by Captain Kingdon Ward. This charming member of the Boothii series is figured in the Botanical Magazine, t. 9120 (1927). A dwarf shrub, about 25 cm. high, with oval to elliptic-oblong leaves, dark green above, glaucous-white and scaly below, about 3 cm. long and 1·5 cm. wide, petioles bristly. Flowers 1-3, terminal, borne on bristly pedicels, the bracts persistent. Calyx large, about 1·2 cm. long, greenish or deep red-brown above, the lobes blunt. Corolla wide open bell-shaped, about 4 cm. across, fleshy, deep yellow.

Rhododendron pectinatum. A.M. April 30, 1935, as a flowering shrub for the cool greenhouse. Shown by Lionel de Rothschild, Esq. A member of the Stamineum series raised from Forrest's seed No. 26022. Leaves oblong, long acute, cuneate at the base, dark green above, bright light green below, white ciliate along the margin, rather variable in size, from about 10·5 cm. long and 2·5 cm. wide to 19·5 cm. long and 6 cm. wide including the slender petioles. Flowers 3 or 4 in each axillary inflorescence, there being often 5 or 6 such inflorescences clustered towards the end of the last year's growth ; calyx divided to the base into 5 narrow, distant, oblong lobes ; corolla 6·5 cm. across, white with a pale yellow blotch on the upper lobe ; tube narrow cylindrical, 2·5 cm. long ; lobes 5, spreading, oblong, subobtusate, 3·5 cm. long, 1·7 cm. wide ; filaments white, exceeded by the style which is 4 cm. long ; ovary narrow and green ; pedicels green, about 2·5 cm. long.

Rhododendron pumilum. A.M. April 30, 1935, as a hardy flowering shrub for the rock garden. Shown by Lord Swaythling. This plant was raised in 1926 from seed collected by Captain Kingdon Ward, No. 6961 ; it belongs to the Lepidotum series. A dwarf prostrate shrub, about 15 cm. high, with numerous small oval to obovate-elliptic leaves which are dark green above and glaucous and loosely scaly below. Flowers 1-3, usually 2, at the ends of the branches, lifted well above the leaves on dark red scaly pedicels which are 3·5 cm. long ; corolla tubular-campanulate, about 1·5 cm. long and as much wide, pinkish-mauve, waxy in texture ; calyx small, dark red and loosely scaly.

Rhododendron repens. F.C.C. April 30, 1935, as a hardy flowering plant. Shown by J. B. Stevenson, Esq., Tower Court, Ascot. A low creeping shrub with small oval leathery leaves which are dark green and somewhat bullate above, bright light green below. Flowers 1-3, borne at the ends of the branches on glandular pedicels which are

about 2.5 cm. long, their bases enclosed by the persistent bracts; corollas tubular-campanulate, with spreading lobes, deep scarlet-crimson, 3 cm. long, 4 cm. across, fleshy.

Rhododendron siderophylloides. A.M. May 21, 1935, as a hardy flowering shrub. Shown by J. J. Crosfield, Esq., raised from seed collected by Forrest (No. 20481). Branches greyish, stiffly erect. Leaves elliptic- to oblanceolate-oblong, apex acute to subacute, base obtuse, about 4-5 cm. long including the short petiole, and about 2 cm. wide, bright green and glabrous above, paler and densely scaly below. Flowers 6-8 in a single terminal rather loose inflorescence, or two lateral inflorescences close to the terminal one and with it forming a single compact globose truss; pedicels up to 2.5 cm. long, light green with a few scales; calyx minute and scaly; corolla wide-spread from a short tube, 5.5-6 cm. across, bright pinkish-mauve with darker spots at the back within, glabrous outside; filaments glabrous; style pale to deep pink, exceeding the stamens; ovary densely scaly. This charming member of the *Triflorum* series, *Yunnanense* sub-series, is well known in gardens as *R. siderophyllum*, under which name it is figured in the Botanical Magazine, t. 8759. It is, however, different from the plant to which Franchet originally gave the name *R. siderophyllum*, having smaller leaves and corollas which are *not* scaly outside, and it is probably the plant to which Franchet gave the name *R. obscurum* in MS. Dr. Hutchinson has named it *R. siderophylloides*.

Rhododendron 'W. Leith.' A.M. April 30, 1935, as a hardy flowering plant. Shown by Admiral A. W. Heneage-Vivian, Blackpill, Swansea. This outstanding hybrid—*R. Loderi* × *R. decorum*—was awarded the Loder Cup in 1934. The leaves are oblong, somewhat narrowed to the subobtuse apex, retuse at the base, 13-16.5 cm. long, 5-7 cm. wide, dull green above, paler below, recurved at the margins, borne on stout petioles 3-4 cm. long. Inflorescence a large, well-formed, rather open truss of 11 flowers borne on light green, minutely red-glandular pedicels which are 5 cm. long; calyces obsolete; corollas funnel-shaped, 6-7 cm. long, 9-10 cm. across, pale greenish-cream, lobes recurved; filaments exceeded by the green, red-glandular style.

Syringa 'Maréchal Foch.' A.M. May 21, 1935. From Major F. C. Stern. A very fine, single-flowered Lilac with light rosy-purple, fragrant flowers arranged in large, open panicles.

Vaccinium Mortinla. A.M. May 21, 1935. From Lord Aberconway, Bodnant. A small, densely branched, evergreen shrub from the Andes of Ecuador and New Granada, not generally hardy round London. The small, coriaceous leaves are crowded along the branches, and the rosy flowers are closely set in short, axillary racemes.

GARDEN NOTES.

Acacia diffusa.—Although *Acacia diffusa* has been known for many years it is still by no means common in cultivation. In the Botanical Magazine (t. 2417) a good figure of the plant may be seen. COMBER, during his expedition in Tasmania in 1929-30, collected both typical *A. diffusa* and a prostrate form, and his field notes give the following description under the number 1346 representing the type: "A rigid, erect, or spreading shrub usually 1-4 feet high. Leaves stiff, spiny. Flowers freely produced in early spring. Pale yellow balls of fluffy stamens. Good, should be fairly hardy in a dry place." A quite prostrate form is mentioned in his notes under No. 1446, and this probably corresponds with the plant now growing at Wisley.

A glance at the photograph of the plant growing at Wisley (fig. 98) in the greenhouse for half-hardy plants well indicates the value of this species as a front row plant in a cool greenhouse where hard frosts are excluded. A temperature down to freezing point certainly does not affect it. The plant here is rather more than a foot in height with spreading, rather pendent branches, and hard shining leaves about an inch or less in length, furnished at the tip with a stiff sharp point. Pale yellow flowers are produced freely on the branches in the axils of the leaves, from one to four on short pedicels in each leaf-axil.

Grown in the manner shown in the photograph overhanging a rock, it is a very attractive plant, requiring no special treatment except that, like all the members of this large genus, it should be given a position where it is exposed to full sunshine.

This species gained an Award of Merit when exhibited by Colonel MESSEL of Nymans at the Royal Horticultural Society's Hall on March 20, 1934.—R. L. Harrow.

Myginda disticha (fig. 99) is a curious little evergreen shrub collected by H. F. COMBER in the Argentine in 1926, No. 448. His field note reads: "Low evergreen shrub, 1'-2', from Nerie (*Nothofagus antarctica*) copses. When exposed bears masses of yellow and scarlet fruits. Leaves dark green, shining. Moist woods, but fruits when it reaches the light. Hardy. 3500-4000 ft. Pulmari."

The plant was first described by Sir J. D. HOOKER from specimens collected by Capt. KING in the region of Magellan Straits, and published in his "Flora Antarctica," Vol. II, p. 254, about 1847. It belongs to the order Celastraceae, where *Euonymus* and *Celastrus* are also found, and resemblance to the former is seen in the small dull red flowers of *Myginda*.

There are two plants in the wild garden at Wisley, of which the taller is rather more than 2 feet in height; both were raised from

COMBER's seed. The bushes are not so dense and compact as the photograph would suggest, but tend rather to have the branchlets clustered together at the top of an otherwise undivided shoot. The small thick Box-like leaves are alternately arranged on the downy shoots, and the inconspicuous little flowers are carried either singly or in pairs in the leaf axils. Between the coloured petals are minute yellowish anthers, and the stigma is slightly raised in the centre. Fruits have not yet been seen. The species seems quite hardy in a position open neither to full sun nor strong winds, and is growing well in rich woodland soil.—*B. O. Mulligan.*

Trachelospermum jasminoides.—*Trachelospermum* is a genus of evergreen climbing shrubs, of which some two or three species are grown in the British Isles. *T. jasminoides* is the one most usually seen, generally on south or west walls in the warmer parts of the country, or under glass where conditions outside are thought to be too severe for it to winter safely. If carefully trained and the young growths kept pinched—except those required for extension—it will cover in time a considerable area of wall space and produce numbers of sweet-scented white flowers during the summer months. At Wisley a specimen has been growing on the south wall of the laboratory for more than ten years, and has come unharmed through several severe winters during that period. The fruits which have been slowly developing during the last few months, are borne on the short side-shoots in the axils of the leaves. The longest is about three inches in length by $\frac{3}{8}$ inch thick, and each pair is the product of a single flower. As many as five flowers may be borne on a common stalk. The seeds within these fruits number about twenty, are narrow, about $\frac{3}{8}$ inch long, and provided with a silky white plume two or three times their own length. Whether they are fertile and capable of giving rise to healthy young plants remains to be proved.—*B. O. Mulligan.*

BOOK REVIEWS

"How we made our Garden." By A. I. Harrison. 4to. viii + 182 pp. (Maclehose, London, 1935.) 5s.

This is the story of the renovation of a two-acre garden which had been left to itself for a few years, and very well it is told.

Not a few are faced with a somewhat similar task, and they would do well to read this book and see how a determined man with knowledge and command of labour set to work and accomplished the transformation of the wilderness into a smiling garden once again. One thing only we should fear to follow if our soil were a light one, and that is his method of burying couch grass 18 inches down. In his case it died and was no more seen, but when we tried burying it alive, even at that depth, it grew and thrived amazingly. Be careful, then, you who have couch to deal with, and follow the better way of turning it into good manure on the compost heap.

Not only does the author describe the means by which he prepared for future crops, but he also gives details of the cultivation he bestowed upon them, and tells of the varieties of plants he chose to grow in the garden. The book is therefore not only useful to those who have to deal with gardens that have become derelict, but to every beginner with a new garden to furnish.

The sixteen full-page illustrations are well reproduced, but not all of them were taken in this renovated garden—some, indeed, not even in Scotland where the garden is.

"Shrubs for Amateurs." By W. J. Bean. Ed. 2. 8vo. ix + 150 pp. (Country Life, London, 1935.) 5s.

Mr. Bean's knowledge and his skill in imparting it are sufficient guarantee for the value of this book. The opportunity given by the publication of a second edition has enabled some few newer shrubs to be included and new illustrations to be given.

The use of shrubs in gardens has not yet reached anything like the extent it might, and the author's wise selection should enable even the wholly ignorant to choose with certainty plants of low price, easy cultivation and low maintenance costs which are bound to give pleasure.

There are chapters on treatment and particularly valuable lists of early- and late-flowering shrubs.

"Primitive Land Plants, also known as the Archegoniatae." By Dr. F. O. Bower. 8vo. xiv + 658 pp. 465 figs. (Macmillan, London, 1935.) 30s. net.

In a general way the Archegoniatae comprise the Mosses, Hepaticae, Equisetaceae, the Ferns and fern allies. Varied as these groups are, they are linked together in a remarkable way, not only by their distinct alternation of generations but by the possession of a peculiar and very definite type of reproductive organ known as the archegonium. This organ not only produces the egg-cell but protects the young embryo, and its prevalence in the primitive types of land plants has long been a centre of interest and speculation with regard to the evolution of land plants.

Professor Bower's masterly treatise, entitled "The Origin of a Land Flora," published in 1908, has long been the classical work on this aspect of evolution. The present volume deals with the same problem in the light of new discoveries—especially amongst fossil plants—which have been recorded during the past twenty-six years, and also of his own theories of size and form. The subject, although of very great interest to the professional botanist, is of a specialized nature and outside the interests of the ordinary horticulturist. It will suffice to say that this new volume, of 658 pages, is marked by that scholarship, charm and enthusiasm which characterize all Professor Bower's writings.

A. D. COLTON.

"Plants seen in Madeira: a Handbook of Botanical Information for Visitors and intending Residents." By Michael Grabham. 8vo. xi + 202 pp. (Lewis, London, 1934.) 8s.

Visitors to Madeira often desire a small book which will guide them among the numerous striking plants encountered in the island, and Dr. Grabham has

provided a reliable one in the present volume. An introduction describes briefly the situation and climate of Madeira, and the first chapter gives an account of some of the more noticeable plants in the Public Garden at Funchal arranged as one is likely to meet them in a tour of the garden. This occupies the first twelve pages, and the remainder of the book is taken up by a "General Dictionary of Plants" arranged alphabetically and including garden plants as well as natives. The key words of the paragraphs are sometimes vernacular names, sometimes names of genera, and this leads to a little difficulty easily overcome in a new edition. The first paragraph illustrates it. We read "ABACA. *Musaceae*. *M. textilis*. MANILA HEMP." The reader is left to guess what the "*M.*" stands for, and to guess aright entails some botanical knowledge which is not generally assumed, for the descriptions of plants are written in simple language free from botanical technicalities but sufficient for identification if some knowledge of genera is possessed. An index of common names (in English) concludes the book.

The proof reading has evidently been done with care, for though not entirely free from errors, none we have noticed is likely to mislead.

"Paxton and the Bachelor Duke." By Violet Markham. 8vo. xii + 350 pp. (Hodder & Stoughton, London.) 20s.

A life of Paxton has been long overdue, and the present volume written by his granddaughter more than fulfils our hopes. What was the secret of this remarkable man who in 1826 was a gardener at this Society's Chiswick Garden and in 1856 figured in the list of office-holders as Sir Joseph Paxton, M.P., Vice-President? The secret was that Paxton, besides his astounding industry and ability, had a "way with him."

Appointed by the Duke of Devonshire as head gardener at Chatsworth, he arrived on May 9, 1826, at 4.30 A.M., scaled the garden walls and inspected the grounds; at 6.0 he set the men to work, at 7.0 the fountains played for his benefit, at 8.0 he breakfasted, and fell in love with his future wife before 9.0 struck! His conquest of the Duke was hardly less rapid. In a few years Paxton had made his employer an enthusiastic gardener, and had become his indispensable companion and adviser. The results at Chatsworth are well known: the garden was remodelled and the vast conservatories became the wonder of the day.

Paxton, however, found time to launch the Horticultural Register in 1831 and the more ambitious Magazine of Botany in 1834, besides writing the Calendar of Garden Operations, the Botanical Dictionary, and, with Lindley, founding the Gardeners' Chronicle in 1841.

In 1845 he subscribed £25,000 to start the Daily News with Dickens, Doyle, and Shirley Brooks. As a side-issue he took a hand in railway development and was made a Director of the Midland Railway in 1843, and worked with the wily Hudson without being fleeced. Such was his business life.

The three threads which Miss Markham so skilfully weaves are almost too Victorian to be true. We see the industrious apprentice rising to wealth and high honours, the lavish and eccentric Duke, and, at home, the faithful wife, managing the house and the husband's affairs in his absence. Each of the trio was necessary to the other. While the Duke of Devonshire was able to show Paxton the world of culture and art, Paxton, in his turn, gave the Duke the decision and purpose he lacked. Most interesting it is to follow the increasing enthusiasm for plants that Paxton inspired in his employer. The arrival of the rare and long-desired *Amherstia* at Devonshire House, the Duke's hurried arising from his bed to breakfast with his gardener beside the unique specimen is a scene of comedy in the best eighteenth-century manner. Ungrateful *Amherstia*, however, refused to flower in the ducal garden and granted this first favour to a suburban garden owned by a commoner.

But the reviewer must resist the temptation, grave though it be, of pulling out plums in the Hornerian manner.

This book should be read by all who are interested in gardening history, and will perhaps surprise those who think that the love of plants other than for decoration is of recent growth.

It has also a very human appeal: we can read between the lines of Mrs. Paxton's letters, through all her devotion and admiration for her man, a tinge of regret at the changes which his success brought to their family life. The company promoter finally overshadowed the gardener, but not, we fancy, bringing any increased happiness. We get a last picture of the great man, enfeebled by age and ill health, visiting a flower show in May 1865 in his own Crystal Palace. Nowhere could he have more suitably breathed his *Nunc dimittis*.

Readers of Miss Markham's previous books will know that she can be informative without being dull and that a glint of humour is never far away. No

gardener will regret the purchase of this most interesting and entertaining volume, and many will share the reviewer's hope that the author, having temporarily left architecture for horticulture, will tarry a little and cultivate for us a few more of the untilled fields of garden history.

E. A. BUNYARD.

"Diseases of the Banana." By C. W. Wardlaw, Ph.D., D.Sc., F.R.S.E. 8vo. 600 pp. (Macmillan, London, 1935.) 30s. net.

The banana has become a crop of such economic importance that too much cannot be known about diseases which attack it. There is a mass of information on the subject, but it is scattered among many countries, and this volume has been written so as to bring relevant work into a comprehensive account of all the known fungal and bacterial diseases of the crop.

The book is one of some 600 pages and, with the exception of three short chapters on diseases of Manila Hemp, is devoted entirely to the banana. It commences with an interesting description of banana cultivation (extensive and intensive) as carried on in the tropics. Stem diseases are then dealt with, and that scourge of banana plantations called Panama Disease is so thoroughly discussed as to occupy well over a hundred pages. Then follow rhizome and root rots, stem and heart rots of the buds, physiological disturbances, and even a disease due to a Nematode. In all cases control measures are fully described. Fruit and leaf diseases, disorders due to unsuitable physiological conditions, virus diseases, and wastage in storage are all included and remedies suggested.

In connexion with wastage in storage there is an interesting account of the history of the development of the banana export trade up to the modern methods of loading and refrigeration during transit.

Four appendices provide lists of all fungi and bacteria (whether parasites or saprophytes) so far found on unhealthy parts of the banana plant; a list of strains of the Banana Wilt (Panama Disease) fungus, with a description of each strain and its growth on various nutrient media, a discussion on imports of bananas into Great Britain and other countries in recent years, statistical tables and data taken from selected banana ships dealing with conditions of temperature, humidity, etc., prevailing in the holds while carrying bananas to England.

There is a list of 559 references to literature on the subject and a very full index.

Throughout the book are to be found numerous graphs, tables, and line drawings, and the excellent photographs included number over 200. The author is to be congratulated on having written a most interesting book, and one of much value not only to pathologists but to all interested in the banana crop. The printing and binding are both excellently done.

D. E. GREEN.

"Suppression of Weeds by Fertilizers and Chemicals." By H. C. Long. 8vo. 57 pp. (H. C. Long, The Birkins, Orchard Road, Hook, Surbiton, 1934.) Paper covers. 2s.

The land to be treated as visualized in this excellent pamphlet is farm land, and the crops farm crops; nevertheless, much valuable information is given for the owner of the garden. The chapters deal with the effect of fertilizers in reducing weeds, the use of lime, of sulphate of ammonia and nitrate of soda, of calcium cyanamide, sulphuric acid, sulphates of copper and iron, finely powdered kainit, sodium and potassium chlorates, arsenical compounds and a number of miscellaneous chemicals. The results of experiments carried out in various parts of this country and in temperate climates abroad should be extremely helpful. There is a list of weeds with their botanical names, but unfortunately no index to the treatment of weeds, though large numbers are mentioned repeatedly in the text.

"Three Years Wanderings in the Northern Provinces of China." By Robert Fortune. 8vo. xvi + 375 pp. (University Press, Shanghai, China, 1935.) Sh. \$22.50.

This account of Robert Fortune's first visit to China is of course well known to many Fellows of our Society, for Robert Fortune was a gardener at Chiswick and was commissioned to make the journey to collect plants by the Society's Council in 1843. He wrote the account of his "Wanderings," and it was published in 1847. It is now republished in a limited edition of one thousand copies without alteration of text, and many Fellows will be glad of the renewed opportunity of reading an account, written with much charm and full of interest, of adventure and hard work in a country then not very friendly to strangers.

The printing, binding and general get-up of the book are excellent.

NOTES AND ABSTRACTS.

Aloe deflexidens. By N. S. Pillans (*S. Afr. Gard.*, 25, p. 36; Feb. 1935).—A dwarf species with leaves 10 inches long, deep green above with white irregularly transverse lines. Flowers tubular, bright red in the tube, with brown (outer) or red and green (inner) segments white at their margins. A new species from Zululand.—*F. J. C.*

Aloe Pillansii. By N. S. Pillans (*S. Afr. Gard.*, 25, p. 36; Feb. 1935; fig.).—A tree form about 30 feet high from Namaqualand, with erect branches. Flowers canary yellow.—*F. J. C.*

Apples, Development of Scab in Stored. By H. Wormald (*Ann. Rept. E. Malling Res. Sta.*, 1934, p. 156).—Among the many spots that may develop on stored apples it now seems that one type can be due to the apple scab fungus, and that this may cause spots during storage on apples that appeared perfectly sound when picked.

These storage scab spots are described as quite different from scab spots seen on the growing fruit before storage. They are sunken saucer-shaped and shiny black in colour and may bear pustules of typical scab spores.

The conclusion is drawn that the ordinary routine spraying against scab should be a regular practice, and if necessary a late spraying must be done. Storage of apples when wet is inadvisable.—*D. E. G.*

Luckhoffia Beukmannii. By A. White and B. L. Sloane (*S. Afr. Gard.*, 25, p. 36; Feb. 1935).—*Luckhoffia Beukmannii* was first described under the name *Stapelia Beukmannii*. It has many-angled stems with the angles raised into compressed nodules at first surmounted by short spines, and is described as being very free-flowering. The flowers are 2½ inches across, brown with yellow spots towards the base.—*F. J. C.*

Plum Bacterial Canker Organism, Preliminary Laboratory Tests of Bactericides on the. By H. Wormald (*Ann. Rept. E. Malling Res. Sta.*, 1934, p. 151).—These are tests to ascertain the bacteriostatic and bactericidal effect of some well-known germicides when used against *Pseudomonas Mors-prunorum*, the organism causing bacterial canker in plum and cherry trees. When these laboratory tests are complete it will be possible to choose the most efficient substance for use against the organism in field control of the disease.—*D. E. G.*

Plums in Storage, Brown Rot of. By H. Wormald and A. C. Painter (*Ann. Rept. E. Malling Res. Sta.*, 1934, p. 148).—Plums in cold storage at about 40° F. were affected by a rot. Of the fungi concerned the predominating one was *Sclerotinia fructigena*, and as most of the affected fruits had been picked without stalks it seemed probable that the fungus had entered through this small wound at the stalk end. Control of the fungus on the tree and care in picking and storing the fruit are some of the measures to be considered for checking this wastage in the store.—*D. E. G.*

Rhododendron Clementinae. By J. Hutchinson (*Bot. Mag.*, t. 9392; May 1935).—A large shrub with broad leathery leaves covered with dense felt of hairs beneath. Flowers in a roundish cluster, deep pink, 6-7-lobed. Collected by Forrest in the mountains of Chungtien and in the Muli Mts. of Szechwan.—*F. J. C.*

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HALF-HARDY AND OTHER MONOCOTYLEDONS FOR SHELTERED POSITIONS.

By J. W. BESANT, Botanic Gardens, Glasnevin.

THE narrow borders flanking plant houses and at the base of sunny walls offer opportunities for cultivating successfully many plants calling for warmer conditions than are available in more exposed positions, and, in the absence of ample frame or cold house accommodation, make possible the enjoyment of much greater variety.

In such positions many plants are grown at Glasnevin, and among others many belonging to the great class of Monocotyledons. Some are well known and generally cultivated, others may not be so common. In practically every case they enjoy what sunshine we get for most of the day in summer.

Acrospira asphodeloides, a tropical African species but inhabiting rocky places, has lived and flourished for many years close in at the base of a cool house. The long green strap-shaped leaves are produced in abundance, and in late summer spikes 3 feet high of white flowers.

Agapanthus, a well-known genus, is represented by several species, including *A. africanus* and varieties *albus* (fig. 100), *Ardernei*, *giganteus*, *intermedius*, *Mooreanus*, *Mooreanus albus*, and *variegatus* (a weak grower), *A. caulescens*, *A. Weillighii* and *Weillighii albus*, the last two graceful plants producing umbels of pendulous flowers in contrast to the spreading arrangement in *A. africanus*.

Agave is represented by *A. Parryi* and *A. utahensis*, both from Arizona, but also hardy in the rock garden here.

Albuca Nelsonii from Natal has proved quite hardy for many years.

It produces bright green leaves, 2 to 3 feet long and a couple of inches wide, tapering to a point ; the flowers, which are white, are borne on scapes about 3 feet or more high. Probably other species of this genus would be worth trying in the open in shelter.

Alstroemerias are popular and striking plants in many gardens, but not all are reliably hardy. Here *Alstroemeria chilensis* is best in a sheltered border, and the same is true of *A. psittacina* producing crimson and green flowers : the latter is a Mexican species and perfectly hardy in some soils. *A. pelegrina* and *A. pelegrina alba* are definitely tender here, and even in sheltered borders have not been a complete success.

Amaryllis Belladonna is above all a plant for sunny, well-drained positions, and is so well known as to call for but brief mention. Many varieties, forms, and hybrids are in cultivation at Glasnevin, and in very few years do they fail to flower. It would perhaps be difficult to say which is the true type plant, some producing taller and stronger scapes than others, but one particularly attracts attention and is known here as the "Straffan Variety." The scape is long and stout and the flowers an attractive soft pink. *A. × Parkeri*, formerly known as *A. Belladonna kewensis*, is now definitely recognized as a hybrid between *A. Belladonna* and *Brunsvigia Josephinae*. The origin and history of the many hybrids supposed to have been raised between *Amaryllis* and *Brunsvigia* have been fully dealt with by competent authority in the JOURNAL R.H.S., vol. 57, p. 8 (1932). It may be added here that *Amarcrinum × Howardii* flowered very well in the late autumn of this year. This hybrid has been in cultivation here for some years in pots but had never flowered. The first year after planting out it made good growth but no flowers ; this year, however, both our original plant and one presented by Kew flowered well. Our experience is that planting out gives better results than pot cultivation.

Antholyzas, natives of Africa, are represented by *Antholyza paniculata*, a coarse plant with strongly ribbed leaves, and reddish-orange flowers in size incommensurate with the amount of foliage : it is generally hardy here in any part of the garden, but *A. aethiopica* hugs the base of a low brick wall outside the Succulent House, where it spreads too freely, invading neighbouring plants. In summer and winter the leaves are bright green and the flowers, rather sparsely produced in winter and early spring, are bright orange-scarlet.

Astelia montana, raised from New Zealand seeds some years ago, makes an interesting subject of totally different habit, forming a tuft of silvery-grey leaves 1 foot to 15 inches long. This species is hardy also on the rock garden, but has not yet flowered.

Beschorneria yuccoides (Bot. Mag., t. 5203), though requiring considerable space for its ample glaucous-green leaves, likes the warmth of these narrow borders. The immense inflorescences many feet long are produced periodically, the stout scape, pink-coloured, bearing prominent pink bracts from the axils of which arise coral-coloured branches bearing pendulous green flowers, a combination of colouring

which, combined with the size of the inflorescence, always evokes interest.

Cautleya lutea, a Himalayan plant (Bot. Mag., t. 6991), is a beautiful and interesting species, probably hardier than is generally supposed. It flourishes here in the narrow borders about the conservatories, and also in a small bog in the rock garden. The bog, however, is drier than the name would imply, but the *Cautleya* enjoys abundance of water in summer. It has the habit and aspect of the Zingibers, growing to a height of 2 feet or so, producing sheathing leaves, the free part 6 to 8 or more inches long, the terminal flower spike 6 to 8 inches long bearing several golden-yellow flowers.

Crinums are among the most successful plants grown out of doors in sheltered positions here and in other gardens. It is unnecessary to dwell on the older species very well known in gardens, viz. *Crinum Moorei* and var. *album*, the hybrid *C. Powellii* and var. *album*, and *C. longifolium*, of which there are several forms varying in width of leaf, size, and colour of flowers. The latter is frequently the first to flower, but the earlier of the more striking Crinums is *C. latifolium* var. *yemense* (fig. 101), a really good plant as hardy here as *C. Powellii*, and never failing to produce flowers and large fleshy fruits. One or two newer varieties, probably seedlings or hybrids, have recently come into cultivation—for instance, *C. haarlemense* and *C. Krelagei*; these are robust forms producing fine flowers of good colour, and are certainly additions from an ornamental point of view. It is not impossible that other species of Crinum would flourish outside if given sufficient protection at the base of a sunny wall and planted deeply enough in well-drained soil. It is certain that they grow much better planted out than in pots. Indoors at Glasnevin are many tropical species, and where room has been found to plant them under staging in warm houses they flower as freely as the hardier sorts outside.

Cypella Herbertii from S. America, and *C. plumbea* from Brazil, are beautiful and interesting subjects for warm sunny positions. The former has yellow flowers somewhat after the shape of a *Tigridia* but smaller: they are produced in succession from the green sheaths. *C. plumbea* produces larger lilac-coloured flowers, the outer segments more reflexed and with brown markings within. They are nearly allied to the *Tigridias*, of which there are many varieties of *T. conchiflora* in cultivation. These too flourish in sunny sheltered borders, creating much interest when in flower. Occasionally they have lived through the winter, but do decidedly better when lifted, stored and replanted like *Gladioli*.

Dianella, a genus represented by several species in the Antipodes, is of value in the garden on account of the striking blue berries. The leaves are generally broadly linear, dark green except in *D. tasmanica variegata*, in which they are striped with pale yellow. Although generally cultivated in the greenhouse, either planted out or in pots, they can also be grown outside in sheltered borders, and seem to enjoy partial shade. The flowers, usually a shade of blue, are not without

beauty but attract less attention than the blue berries produced in autumn and winter. The species grown out of doors here are *D. coerulea*, *D. tasmanica* and *D. tasmanica variegata*. *D. aspera* and *D. intermedia* have not been tried in the open, though there seems no reason why they should not prove equally hardy.

Elisena longipetala has proved perfectly hardy outside the Palm House for many years. The position is by no means ideal as it is exposed to the south-east, nevertheless the tall scapes are produced annually without fail, carrying an umbel of white flowers, the segments long, linear, and recurved, and in the centre a deep crown after the manner of *Hymenocallis*. Introduced from Peru nearly a hundred years ago, and figured in the Bot. Mag., t. 3873.

A number of *Gladioli* are found to do well under such conditions, notably the typical *Gladiolus primulinus*, which produces its pale primrose-yellow flowers in late autumn, and *G. tristis*, pale creamy flowers with brown spots (fig. 102). *G. alatus*, *G. cardinalis*, *G. cuspidatus*, *G. odoratus*, and other S. African species are being tried. Owing to their growth during our winter months it is unlikely that some of the more delicate species will be a permanent success in the open. As late as December the flowers of *G. watsonioides* sometimes appear: of hooded form and a very beautiful rose-red colour, they are much admired, carried on spikes 3 feet or more high. As with other S. African plants, the *Gladioli* probably need more sun than we get, though I have seen fine spikes of *G. watsonioides* from S. Wales, where the rainfall is much in excess of that at Glasnevin.

Hedychium, a genus of the Ginger family, provides several species suitable for sheltered places outside. A fair proportion of them are natives of the Himalayas, notably *H. Gardnerianum*, which has lived in a narrow border outside the Palm House here for many years; it is figured in the Bot. Mag., t. 6913. *H. Forrestii*, a comparatively recent introduction from China, is perfectly hardy in a narrow sunny border. In addition to the flowers borne in terminal racemes the *Hedychiums* are attractive foliage plants, in this respect rivalling the related Cannas, of which both green and purple varieties live under the same conditions.

Hippeastrums are best represented here by *Hippeastrum Ackermannii*, an old group of which gives annually a magnificent display of its crimson flowers, as many as thirty scapes being produced. *H. pratense* is equally successful though smaller in size, flowering much earlier, the flowers orange-red. *H. advenum* also grows at the base of a sunny wall, but does not flower with the freedom of the two mentioned, and gives the impression that it requires more heat.

Homeria collina flowers annually and close in at the base of a sunny wall has lived undisturbed for many years. A more recent form sent here some years ago from a former correspondent in S. Africa has been identified as *H. collina aurantiaca*, and is somewhat more robust than the older plant.

Hymenocallis, a genus beloved of stove-plant enthusiasts of other

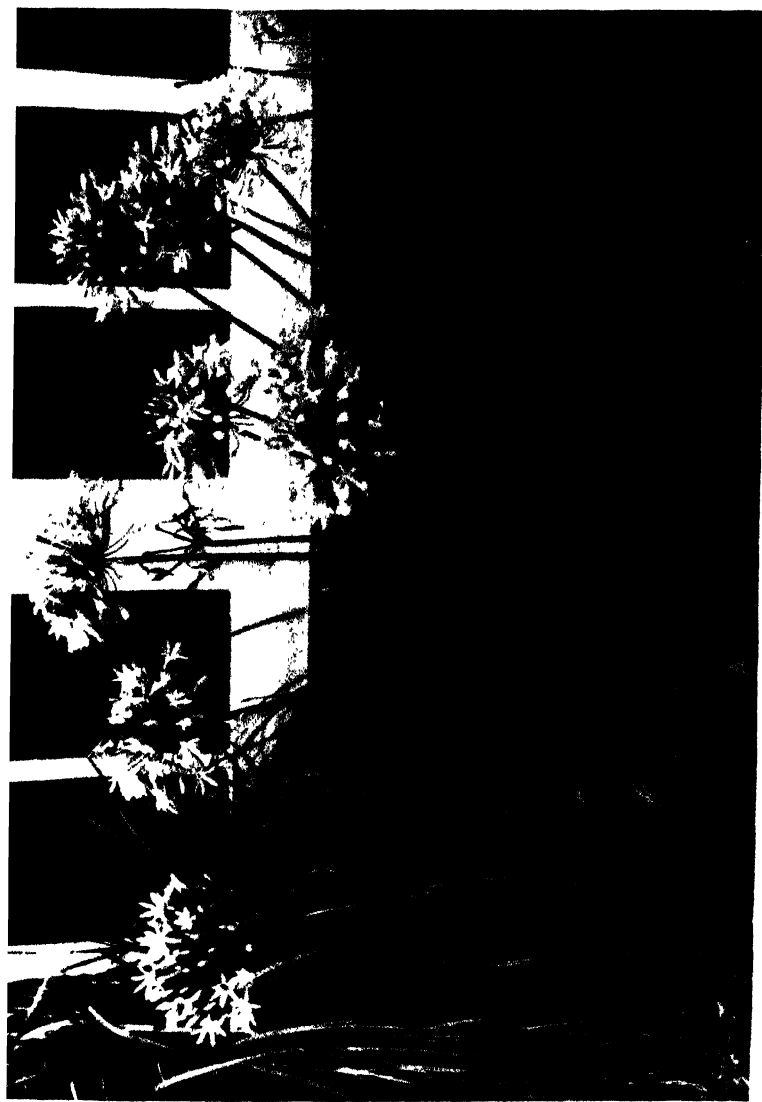


FIG. 160.—*AGAPANTHUS AFRICANUS ALBUS*.



FIG. 101 -*CRINUM LATIFOLIUM YEMENSE*

times, includes a few species capable of outdoor culture in suitable positions: of these *H. Amancaes*, *H. Macleana*, and *H. × festalis* (*Ismene festalis*), a hybrid between *H. calathina* and *Elisena longipetala*, are usually successful. Messrs. C. G. Van Tubergen have recently offered several attractive garden forms which so far have grown satisfactorily here, namely, 'Sulphur Beauty,' 'Sulphur Gem' and 'Sulphur Queen,' hybrids of garden origin.

Irises of several sections find suitable conditions in these narrow borders, notably *Iris unguicularis* in at least half a dozen varieties, flowering from November until April. *I. reticulata* does remarkably well, some of the clumps having been in position undisturbed for many years. *I. Histrio* and *I. histrioides* like a good stiff soil and all the sun possible in summer. The Californian species and hybrids likewise grow and flower well near the front of the borders. *Iris Wattii* makes woody stems 2 to 3 feet high, and the Evansia—*I. tectorum*—grows and flowers freely in the sun.

Ixiolirion montanum, formerly better known as *I. Pallasii*, likes a narrow border in full sun. It is figured in the Bot. Reg., vol. 30, t. 66, where the slaty-blue flowers with recurved segments are well depicted.

Several Kniphofias are more successful in these narrow borders than elsewhere, notably *Kniphofia Nelsonii*, and the hybrids *chrysantha* and *Goldelse*, also *K. pauciflora*, *K. breviflora*, and *K. longicollis*; and, in a corner sheltered from wind, *K. Northiae* has flourished for many years.

Romuleas flourish close in at the base of a sunny wall where they become well ripened in summer, and similar positions at the base of a rock can be found in the rock garden. The species *Romulea Bulbocodium*, *R. Clusiana*, and *R. rosea* have proved most successful.

Musa japonica in a sheltered bay between two houses is 10 feet high, although planted but a few years. A hay rope is wound round the stem as a precaution in winter. The correct specific name would seem to be *M. Basjoo*, and the habit is well illustrated in The Garden, January 7, 1899, p. 3. No attempt at fruiting has been made by the Glasnevin plant, but our climate is far removed from that of Cornwall.

Nerine Bowdenii is now so well known as to call for but passing mention, although it is beyond doubt one of the finest and most satisfactory autumn-flowering bulbs; several varieties differing in shades of pink are grown, and all are good.

Orthrosanthus chimboracensis, a good blue-flowered plant with broad grass-like leaves, allied to *Sisyrinchium*, is interesting, and grows well in a sunny border backed by a greenhouse.

Rhodostachys carnea, a Bromeliad from Chile, makes large masses close against a brick wall and generally flowers freely, the pink inflorescence produced in the centre of the leaf rosettes. The related *Fascicularia pitcairniifolia* is also good: of similar habit, the central inflorescence is composed of a closed head of blue flowers surrounded by the brilliant scarlet basal half of the upper leaves. More striking than either perhaps is *Pitcairnea spathacea*, with broader leaves also

spiny, producing a flower scape 3 to 4 feet long, furnished with bright pink bracts. The inflorescence is a panicle, the flowers with pink, green-tipped sepals and blue petals, each subtended by a pink bract. Illustrated in the Gard. Chron., vol. 72, p. III.

Sternbergia lutea and *S. macrantha* are to be recommended for hot sunny spots where the soil becomes dry and warm in summer. In districts where the conditions are suitable they flower pretty regularly, but where the sunshine record is low care is required in choosing the sunniest places available, such as the base of a wall in stiff soil. The flowers produced in late autumn are particularly welcome then.

Zephyranthes candida is well worth growing and succeeds under the same conditions as the 'Belladonna Lily.' When happy the pure white flowers are produced abundantly. *Z. carinata* and *Z. rosea* have both been grown in the same way, though here the flowers have not been produced so abundantly or so regularly, probably because our annual sunshine average is below that of many other parts of the British Isles.

SPRAYING TRIALS AGAINST THE RASPBERRY BEETLE (*BYTURUS TOMENTOSUS* FAB.).

By R. A. HARPER GRAY, M.A., M.Sc., Armstrong College, Newcastle-upon-Tyne, and H. E. BROOKS, N.D.H., Cumberland and Westmorland Farm School, Cumberland.

THE Raspberry Beetle is well known to gardeners and fruit-growers on account of the damage done in its grub stage to Raspberries, Loganberries and cultivated Brambles. The fruit when gathered is often found to be infested with the so-called "maggots" to such an extent as to render it unfit for marketing purposes.

In the North of England there are few large areas of Raspberries grown, but the sum-total of small plantations in market gardens, orchards and private gardens is considerable, and the amount of infested fruit observed in these by the writers, as well as the many complaints received from growers, have shown the need for some direct and practical means of controlling the pest. At the same time it should be noted that, though the infestations are generally distributed in northern districts, plantations occur which appear to have escaped damage over a period of years. One such instance may be noted where the Raspberries in the garden of one of the writers has shown no damage from the beetle, in the way of grub-infested fruit, throughout a period of eight years. On the other hand, in the plantation attached to the Farm School at Newton Rigg (Cumberland) the records of annual losses go back several years.

It is within only comparatively recent times that promising results have been obtained from certain washes and dusts applied at the time of the beetle's activities on the developing Raspberry buds and blossom. In 1932 trials were carried out at Newton Rigg with pyrethrum, derris, and nicotine spray fluids and a mineral oil emulsion. These substances were applied only once, and though the results were significant if somewhat erratic, the 1932 trials could only be regarded as preliminary ones. In 1933 tests were again carried out and materials which gave good results then were included in the trials for the following year (1934). The writers feel that these 1934 trials may be of interest to northern growers seeing that in the Advisory Leaflet, No. 164,* of the Ministry of Agriculture, doubt is expressed as to the advisability of relying upon a single spraying for controlling the pest in all districts, and they are "advised not to abandon the double spraying until they are assured on the point."

Twelve rows of Raspberries, each approximately 45 yards long,

* This leaflet gives a description and details of the life-history of the Raspberry Beetle.

were available. The rows are planted in pairs, the pairs being separated by a space of 12 feet in which Apple trees are grown. Before the trials were begun some of the trees had been removed, the spaces being used temporarily for growing vegetables.

The varieties in the order grown are shown in the following table, as are also the materials used, the bud stage when sprayed or dusted, and the percentage of damaged fruits. The percentage of clean fruit is added.

Rows.	Materials.	Stage of Buds: O.B. Opening Bud. F.O.B. Fully-Opened Bud. P.F. Petals Falling.	Percent- age of Damaged Fruits.	Percent- age of Clean Fruits.
1. Perfection .	Barium silico-fluoride wash	O.B., P.F.	12.5	87.5
2. Perfection .	Derris wash	O.B., P.F.	11.5	88.5
3. Renown .	Nicotine wash	O.B., P.F.	19.0	81.0
4. Baumforth .	Barium silico-fluoride wash	O.B., F.O.B., P.F.	15.5	84.5
5. Baumforth .	Derris wash	O.B., F.O.B., P.F.	12.5	87.5
6. Devon .	{ Derris dust Derris wash	{ O.B., F.O.B. P.F.	18.0	82.0
7. Devon .	Do.	Do.		
8. Pyne's Royal	{ Barium silico-fluoride dust Barium silico-fluoride wash	{ O.B., F.O.B. P.F.	21.5	78.5
9. Pyne's Royal	Do.	Do.		
10. Perfection* .	—	—	—	—
11. Lloyd George*	—	—	—	—
12. Baumforth .	Derris wash	O.B., F.O.B., P.F.	13.5	86.5
Controls .	—	—	41.0	59.0

* Rows 10 and 11 were dusted three times with barium silico-fluoride, but unfortunately a flaw in the dusting machine was found to be causing a want of uniformity in the distribution of the dust. It was considered advisable, therefore, to leave these rows out of account.

Rows 1, 2 and 3 each received two applications on June 11 and 25 respectively, while rows 4 and 12 were each treated three times, viz. June 11, 19 and 25 respectively. On July 19 not less than 200 berries were picked from each row and examined, notes being made of the numbers of larvæ still present, the amount of "plug" damage, and number of berries showing damage caused by the adult beetle. In the table the numbers refer only to berries showing "plug" and evident adult damage.

It will be seen that all treatments gave a more or less satisfactory control, the highest percentage of clean fruits being 88.5 and the lowest 78.5, as compared with the "controls" which show 59 per cent. of clean fruits. As regards two of the liquid sprays used—a proprietary wash composed of barium silico-fluoride and a liquid derris wash—no striking result followed *three* applications as compared with *two*. Nicotine, included for purposes of further comparison, gave a fairly efficient control.

From previous experience with dusting in this area, which is about 580 feet above sea level and much exposed to winds, the writers decided that wet spraying was more efficient in action. Nevertheless, a combination was used in rows 6 and 7, a derris dust being applied when the buds were opening and when fully open, and a derris wash when the petals were falling. This gave a good control, represented by 82 per cent. of clean fruits, but inferior in efficiency to the results following two sprayings with a liquid derris (Row 2). It is significant also that barium silico-fluoride applied similarly in rows 8 and 9 was still less efficient as shown by the percentage of clean fruit (78.5), and distinctly inferior to the result obtained from two fluid sprayings of barium silico-fluoride (Row 1).

A contrast is again seen in row 12 where a return was made to the use of a liquid derris spray which gave a good control, 86.5 per cent. of the collected fruits being clean.

As regards the time of spraying, a comparison of the preliminary trials of 1932 and 1933 with those described above suggests that no special date in June can be laid down, as the time of appearance of the beetles, as well as of the opening of the buds, may vary from year to year. In 1934, for example, a beetle was found resting on the stalk of an unopened bud as early as May 15 in a plantation in Northumberland, and at Newton Rigg the beetles were beginning to be fairly easily found on the Raspberries at about the time of the first spraying on June 11. In 1932 they appeared about a week later in June on the blossom buds. Hence the time of the first application should be controlled by the opening of the buds, and for practical purposes this would appear to be at the time when the buds are easily observed to be opening, but not fully opened.

CONCLUSIONS.

- (1) The trials indicate that the most efficient control was obtained by the use of derris and barium silico-fluoride washes.
- (2) The derris fluid spray gave the best control and showed more uniformity in action as compared with liquid barium silico-fluoride.
- (3) A nicotine wash did not give such a good control as either of the above.
- (4) Two applications of the liquid sprays were sufficient for securing a good practical control—one during the opening of the buds and the other when the petals were falling.
- (5) Applications consisting of a combination of dusts and a wash gave consistently inferior results.
- (6) The time of applying the first spray is controlled by the opening of the buds rather than by any special date in June.

AN APPROACH TO STANDARDIZATION IN THE COLOUR DESCRIPTIONS OF FLOWERS.

By MISS M. E. BUNYARD.

INTRODUCTION.

IN view of the real need for greater uniformity and accuracy in the colour description of flowers among both botanists and horticulturists, the following scheme, upon which some plan of standardization may be based, has been worked out during the past year.

Taking RIDGWAY'S Colour Standards and Colour Nomenclature as a basis—as being the most suitable colour chart of those available—some 500 flowers have been matched and classified. In some instances the colours required were not found in RIDGWAY, and as secondary charts, OBERTHUR'S Répertoire and KLINCKSIECK'S Code have been used.

The matching of the colours has been done in a north light, of relatively uniform intensity and against a background of a light grey-green, or in some cases neutral grey. The grey-green was chosen as being more akin to the natural conditions under which the flowers are generally seen. Each colour has been matched when the flower was open and as near perfection of bloom as possible, and where there are different tones in one flower the "general hue" has been noted. In flowers which have two or more distinct hues, such as *Gaillardia* or *Anemone fulgens*, each hue has been noted separately.

In a few instances no pigment colour has been found to "match" with certain flower colours, notably "Apricot," such as the Roses 'Roselandia' and 'M. D. Hamill.' RIDGWAY'S 19D Buff Yellow comes nearest, but is neither clear nor bright enough. His Apricot Yellow 19B is too "buff." Again, a whole series of Roses of the 'Red Letter Day,' 'K. of K.' and 'Hawlmarm Crimson' type stand apart and have no match with any of the standard charts. Crimson lake of the water-colourists appears to be near in some cases, but again lacks the luminosity and intensity of colour present in these flowers. In these flowers the luminosity is due to the texture of the petals giving light effects which are unobtainable in pigments. In order to fit such examples into the scheme it will be necessary to take one well-known flower as a standard and match others with it.

With regard to the colour names, many of these appear abstruse and would convey no special colour concept to the majority of people. For these a well-known flower could be cited as a match. For example, by describing *Calluna vulgaris Serlei rubra* as Rosolane Pink no particular hue of pink is conveyed to the mind, but since Almond

blossom—of a well-known colour—is also a close match to Rosolane Pink, *Calluna vulgaris Serlei rubra* could well be described as similar in hue to Almond blossom.

It must be remembered that any attempt to standardize colour descriptions of flowers can only be approximate. The personal element—the fact that colour perception is really an individual sensation—itself makes exact standardization impossible. Other important factors must also be taken into consideration—the environment of the flower viewed, whether singly or in the mass; against what background or in what intensity of light; development and variation—at what period of development the flower colour is noted, as this changes considerably between the bud and fading. There is also the possibility of variation of colour caused by wet or dry seasons, and the effects of soil or fertilizers.

It may here be noted that the flowers matched in this scheme were all taken from one nursery during one year, so that a certain uniformity in these respects has been possible, but even so, on account of the dryness of the early summer (1934) the first Rose blooms were not so fine or so rich a colour as the autumn blooms after some rain had fallen. There is always some slight difference in the first and second flowerings, but this year it was very marked.

Perhaps the greatest obstacle to standardization is the difficulty of obtaining a true standard of named colours for comparison and the fact that colours of many pigments differ in fundamental respects from flower colours, both chemically and optically.

The question of variability and complexity of colour must also be taken into account. Very few flowers are of one tone—termed “selfs”; most have many gradations of tone, varieties of hue and inflections of tints and shades, which go to make up the softness and charm of the whole. Some Roses have as many as five distinct hues, and Irises present many gradations of tone.

In the following examples the more complex flowers have been omitted for the present, but in many instances the chief hue of the flower could be described.

The scheme as presented admits of infinite expansion and development, and in adding to the lists of flowers matched there will undoubtedly have to be additions to the lists of colours. RIDGWAY has over 1000 hues, tints and shades in his chart, and of these about 140 have been made use of at present. These comprise a wide and representative selection of both colours and flowers, and it will probably not be necessary to add greatly to the number of colours. It is obviously desirable to keep this as low as is possible.

The examples given should be sufficient to show that approximate standardization by this scheme is possible and an infinitely more accurate method of colour description is available to both catalogue compilers and the gardening public.

EXPLANATION OF ABBREVIATIONS.

1. The numbers in the first column refer to the colours in Ridgway's Chart, and the colours are given in the order of—

- (a) Hues.
- (b) Shades, from hue to darkest.
- (c) Tints, from hue to lightest.

A number followed by an apostrophe (11'd) refers to a "broken" colour, i.e. a hue with some admixture of neutral grey, the number of apostrophes indicating the percentage amount of grey added. See Ridgway, p. 18.

2. O. 93/1 refers to Oberthur's Répertoire, p. 93, tone 1. K. refers to Klincksieck's Code des Couleurs. Where these are omitted, it is to be understood that the particular Ridgway colour is not represented in them.

- 3 L. means "lighter."
- d. "darker."
- br. "brighter"
- T. "tone (in Oberthur)."
- g h "the general hue of the flower taken when "out" and indicates that there are other secondary tones.

4. Colours from the Répertoire are given as nearly as possible in the positions in which they fall between Ridgway's colours, i.e. O. 111/1, 2, 3, 4. Rouge Geranium falls between Ridgway's Spectrum Red and the first tint, Begonia Rose.

EXAMPLES.

- 1. **Spectrum Red.** K. No. 26 O. 93/1.
Rowney's Water Colour. Scarlet Lake.
Examples.—Carnation 'Robert Allwood' (g h).
Rhododendron Thomsonii (transmitted light)
Verbena chamaedrifolia (br.).
Monarda 'Cambridge Scarlet' (deeper tone).
- Shades ii. **Carmine.** K. No. 1. O. 165/2.
Examples.—Carnation 'Wivelsfield Crimson' (g h).
Tulips 'Crimson King' (backs of petals), 'Bartigon' (g.h. inside), 'King Harold' (d. and more luminous).
Rhododendron Thomsonii (reflected light).
Gaillardia 'The King' (central tone).
- 1k. **Ox-blood Red.** K. No. 3 (nearest). O. 171/3 (nearest).
Example.—*Crataegus Oxyacantha* berries.
- Tints. Oberthur. 111/1, 2, 3, 4. Rouge Geranium.
Examples.—Tulip *Gesneriana* var. *spathulata* (T. 1, 4).
Rose 'Gwyneth Jones' (T. 1, also 121/2, 3).
- 1b. **Begonia Rose.** K. No. 11 (nearest). O. 123/3.
Examples.—Carnation Allwood's 'Salmon Pink' (g.h.).
Camellia Donckelares.
Geranium 'Lady Laurier' (g.h.).
Roses 'Irish Elegance' (L.), 'Gorgeous' (g.h., L.).
- 1f. **Hermosa Pink.** O. 128/1 (nearest).
Examples.—Roses 'Pharisaer', 'Kathleen Harrop' (g.h.),
'Cecile Brunner' (with cream), 'Mme. Segond Weber' (g.h.), 'Shot Silk' (d.), 'Precose' (g.h., d.).
Carnation Allwood's 'Rose Pink' (d.).
- 3. **Scarlet-Red.** K. No. 26. O. 112/2.
Rowney's Water Colour. Scarlet Alizarin.
Examples.—*Penstemon barbatus*.
Anemone fulgens (inside of petals (see 3b)).
Tulips 'Crimson King' (inside of petals, d.),
'Macropsella' (g.h., very luminous).
Dwarf Polyantha Rose 'Paul Crampel' (L.).
Rose 'Golden Salmon' (g.h.).
Between 3 and 5.—*Lychnis chalcidonica*.
Rose 'Schwaben' (g.h.).
Dwarf Polyantha Rose 'Gloria Mundi.'



FIG. 102 - GLADIOLUS TRISTIS
(p. 336.)

To face p. 344

- Tints. 3b. **Rose Dorée.** K. between Nos. 36 and 41. O. 118/4.
 Examples.—*Anemone fulgens* (outside of petals).
Gladiolus 'Early Sunrise' (g.h.), 'Odin' (g.h., L.).
Roses 'Padre' (g.h.), 'Gwyneth Jones' (outside of petals), 'Mrs. Sam McGredy' (g.h.), 'I Zingari' (g.h.), 'Betty Uprichard' (g.h., L.), 'Ivy May' (g.h., L.), 'Prince Charming' (g.h., L.), Dwarf Polyantha Rose 'Coral Cluster' (more orange, L.).
5. **Scarlet.** K. No. 76. O. 80/1 (nearest).
 Rowney's Water Colour. Chinese Orange.
 Reeve's Water Colour. Azo Orange.
 Examples.—*Pyracantha coccinea Lalandei* berries.
- 5' **Coral Red.** O. 76/3.
 Examples.—*Physalis Bunyardi*, fruit calyces.
Chaenomeles japonica alpina.
- Tints. 5b. **Peach Red.** K. No. 66 (nearest). O. 109/4.
 Examples.—*Gladiolus* 'Salmonea', 'Hermione' (g.h.).
Roses 'Severine', 'Mme. Ed. Herriot' (g.h.), 'Emma Wright' (g.h.), 'Duchess of Atholl' (g.h., L.), Dwarf Polyantha Rose 'Orange King.'
- 5f. **Shrimp Pink.** K. No. 28B. O. 109/1 (nearest).
 Example.—Rose 'The New Dawn' (g.h.).
7. **Grenadine Red.** K. No. 81 (nearest). O. 59/4.
 Example.—*Nasturtium* 'Scarlet Gleam.'
- Tint 7b. **Grenadine.** K. No. 86 (nearest). O. 90/3.
 Examples.—*Lilium tigrinum splendens* (g.h.).
Dahlia 'Peggy Wood' (g.h.).
Roses 'Mrs. G. A. Van Rossem' (g.h.), 'Independence Day' (g.h.), 'Lady Roundway' and 'Angèle Pernet' (g.h.), 'Lamia' (g.h.), 'Admiration' (g.h., L.).
- Tints of 9 (Flame 9 (Flame Scarlet). 9'd. **Salmon Colour.** K. No. 91. O. 72/2.
 Example.—Lupin 'Elizabeth Arden' (g.h.).
- 9b. **Bittersweet Orange.** K. No. 106. O. 55/3.
 Example.—Rose 'Crépuscle' (g.h.).
11. **Orange Chrome.** K. No. 106 (nearest). O. 58/1.
 Rowney's Water Colour. Chrome No. 4.
 Example.—*Montbretia crocosmiaeflora* (g.h.).
- Tints. 11d. **Light Salmon Orange.** K. No. 91 (nearest). O. 72/3.
 Examples.—*Roses* 'Mme. Ravary', 'Irish Fireflame' (g.h.).
- 11'd. **Salmon Buff.** K. No. 78/c (nearest). O. 73/2.
 Example.—Lupin 'C. M. Pritchard.'
- 11f. **Orange-Pink.** K. No. 96 (nearest). O. 72/1.
 Example.—Lupin 'Bronze Queen' (keels).
13. **Cadmium Orange.** K. between Nos. 126 and 131. O. 54/1.
 Rowney's Water Colour. Chrome No. 3.
 Examples.—*Daffodil* 'Firebrand' (cup).
Cheiranthus Alhoni.
Asclepias tuberosa.
- Tints. 13d. **Capucine Orange.** K. No. 136. O. 55/1.
 Examples.—*Roses* 'Lady Hillingdon' (g.h.), 'Roselandia' (g.h., but more apricot).
- 13'd. **Light Ochreous Salmon.** K. No. 121 (nearest). O. 65/3.
 Example.—Rose 'Mrs. O. Fisher' (g.h.).
15. **Orange.** K. No. 131 (nearest). O. 49/3.
 Examples.—*Eschscholzia* 'Orange King'.
Buddleia globosa (g.h.).

- Tints. 15b. **Capucine Yellow.** K. No. 136 (nearest). O. 327/3.
Examples.—*Hemerocallis aurantiaca* (deeper tone).
Rose 'Doris Trayler' (g.h., L.).
17. **Cadmium Yellow.** K. No. 156 (nearest). O. 48/3.
Rowney's Water Colour. Transparent Gold Ochre.
Examples.—Yellow Crocus (Dutch).
Coreopsis auriculata superba (d.).
Helopsis scabra (L.).
19. **Light Cadmium.** K. No. 176. O. 23/3.
Rowney's Water Colour. Chrome No. 2.
Examples.—*Kerria japonica* (d.).
Trollius europaeus.
Gaillardia 'The King' (tips of petals).
- Tints. 19b. **Apricot Yellow.** K. between Nos. 161 and 166. O. 27/1.
Examples.—Roses 'Rev. F. Page Roberts' (g.h.), 'George Elger' (L.), 'Lord Lambourne' (g.h., L., fringed pink).
- 19'b. **Mustard Yellow.** K. No. 166 (nearest). O. 28/3.
Example.—Rose 'Mrs. Wemyss Quin' (g.h.).
20. **Light Cadmium-Lemon Chrome.** K. No. 181. O. 22/4.
Rowney's Water Colour. Aureolin.
Examples.—*Ulex europaeus*.
Buttercup (*Ranunculus acris*).
Rudbeckia laciniata fl. pl. and R 'Herbstonne.'
Helenium 'Gartensonne.'
Aster Linosyris.
Chrysanthemum 'W. Sabey.'
- 20'. **Primuline-Wax Yellow.** K. No. 201. O. 21/3.
Example.—*Achillea Eupatoria*.
O. 22/1, 2, 3. Jaune d'Auréoline.
Examples.—*Helianthus* 'Lodden Gold' (T. 3), 'July Sun'
Helenium pumilum magnificum.
Helenium 'Riverslea Beauty.'
Rose 'Christine' (g.h.).
21. **Lemon Chrome.** K. No. 206. O. 20/2.
Rowney's Water Colour. Chrome No. 1.
Examples.—*Hamamelis mollis*.
Eranthis hyemalis.
Morisia hypogaea.
Tulips 'Ophir d'Or,' 'Mrs. Moon.'
Daffodils (trumpets) 'Emperor,' 'Tresserve,'
'Empress,' 'Olympia,' etc.
Mimulus duplex.
Inula Oculus-Christi.
Solidago canadensis.
'Chrysantha Marigold' (g.h.).
- 21'. **Wax Yellow.** K. No. 186. O. 23/2.
Examples.—Daffodils (trumpets) 'King Alfred,' *Narcissus odoratus*.
Tulips 'Golden Crown' (g.h.), 'Tea Rose' (L.),
'Golden Crown' (L., inside).
- Tints. 21b. **Empire Yellow.** K. No. 186 (nearest). O. 21/2.
Examples.—*Forsythia suspensa* and *F. viridis*.
Aster luteus.
Gladiolus 'Souvenir' (g.h.).
Pompon Chrysanthemum 'Sulphur.'
Roses 'Julien Potin' (g.h.), 'Mabel Morse,'
'Souvenir de Claudius Pernet' (g.h.).
- 21d. **Pinard Yellow.** K. No. 191. O. 22/1.
Examples.—Rose 'Mrs. Beatty' (g.h.).

23. **Lemon Yellow.** K. No. 231. O. 19/2.
 Examples.—Jonquil 'Golden Sceptre' (perianth).
 Daffodil 'King Alfred' (perianth).
Verbascum phlomoides (Mullein).
 Common Mustard flower.
 Laburnum (L.).
Solidago brachystachys (L.).
Rosa spinosissima Yellow (g.h., L.).
- Tints. 23'b. **Citron Yellow.** K. between Nos. 236 and 241. O. 18/2.
 Examples.—*Jasminum nudiflorum*.
 Lupin 'Sunshine' (keels, L.).
 Tulip 'Tea Rose' (g.h., L.).
- 23d. **Pieris Yellow.** K. No. 256 (nearest). O. 16/1.
 Examples.—Carnation Allwood's 'Wiversfield Buttercup' (g.h.).
 Daffodils (perianth) 'Emperor,' 'Tresserve,'
 'Orange Cup,' 'Olympia,' etc.
Primula sikkimensis.
 Rose 'Yellow Austrian' (g.h.).
Saxifraga Elizabethae (L.).
 Viola 'Moonlight' (L.).
- 23'f. **Naphthalene Yellow.** K. No. 221. O. 12/4.
 Examples.—Lupin 'Sulphur Gem.'
 Rose 'Mrs. Chas. Lamplough' (g.h.).
 Tulip 'Picotee' (d.).
- Tints. 25'd. **Light Chalcedony Yellow.** K. No. 228 c. O. 14/4.
 Example.—*Saxifraga apiculata*.
- 25f. **Sulphur Yellow.** K. No. 271. O. 12/4.
 Example.—Rose 'Mermaid' (g.h.).
- Tints. 49b. **Salvia Blue.** K. between Nos. 431 and 436.
 Examples.—Delphiniums 'Lize van Veen,' 'Mrs. P. Nelke' (g.h.), 'Harry Smeetham' (g.h.), 'Belladonna,' 'F. Koppius' (L.), 'Persimmon' (g.h., L.), 'Queen Mary' (outer petals, L.).
- 49d. **Mazarine Blue.** K. No. 441.
 Examples.—Delphiniums: 'Belladonna Semiplena' (g.h.).
 Outer petals of 'Mrs. T. Carlisle,' 'H. Poortman,' 'Yvette Guilbert,' 'M. Blackmore,' 'Glory,' etc.
- 49f. **Pale Mazarine Blue.** K. No. 446 (nearest).
 Example.—Delphinium 'Queen of Spain' (faintly shot Mallow pink).
51. **Bradley's Blue.** K. No. 426 (nearest).
 Rowney's Water Colour. French Ultramarine.
 Example.—Lithospermum 'Heavenly Blue.'
- 51'. **Commelina Blue.** K. between Nos. 431 and 436.
 Example.—Delphinium 'Lord Lansdowne.'
- Tints. 51b. **Amparo Blue.**
 Examples.—*Anchusa* 'Opal.'
 Delphinium 'M. Closon' (suffused 61f).
- 51*b. **Forget-me-not Blue.** K. 441. O. 213/1 (nearest).
 Example.—*Ceanothus Veitchii*.
53. **Phenyl Blue.** K. No. 426.
 Examples.—*Anchusa* 'Morning Glory'.
 Delphiniums 'Guardsman,' 'Lorenzo' (L.),
 'Belladonna Wendy' (g.h.), 'Souvenir de J. Bourgerette' (also 59).
- 53'. **Cornflower Blue.**
 Examples.—*Salvia uliginosa*.
Mertensia schioides (d.).

- Tints. 53b. **Light Violet Blue.** K. No. 461 (nearest).
Examples.—*Symphytum officinale* (g.h.).
Delphinium 'Lorenzo' (tones in).
- 53''b. **Deep Aniline Lilac.** K. No. 487 (nearest).
Examples.—*Echinops Ritro*.
Ceanothus azureus (g.h., L.).
55. **Blue-Violet.**
Example.—Delphinium 'Lamartine' (g.h.).
- 55'. **Soft Blue-Violet.**
Example.—*Veronica amethystina*.
- Tints. 55f. **Pallid Blue-Violet.**
Example.—Rosemary.
- 55''f. **Pale Verbena Violet.** K. No. 496 (nearest).
Example.—Aster 'Queen Mary.'
57. **Bluish Violet.**
Examples.—Delphinium 'Rev. E. Lascelles' (tones in).
Dracocephalum Forrestii (d.).
- 57'. **Soft Bluish Violet.**
Examples.—*Veronica longifolia subsessilis*.
Iris sibirica acuta and 'Emperor.'
- Tints. 57b. **Light Bluish Violet.**
Example.—*Linum alpinum*.
- 57''b. **Light Dull Bluish Violet.** K. No. 486. O. 202/2.
Examples.—Clematis 'Mrs. Cholmondeley' (greenhouse).
Scabious 'Goldingensis.'
Clematis macropetala (L., inside).
- 57''d. **Bluish Lavender.** K. between Nos. 486 and 491.
Examples.—*Crocus Sieberi* (outside).
Asters 'Brussels,' 'Ideal.'
59. **Spectrum Violet.** Rowney's Water Colour. Mauve.
Examples.—Delphinium 'Souvenir de J. Bourgerette' (tones in).
Tradescantia 'Leonora' (richer tone).
- 59'. **Bradley's Violet.**
Examples.—Tradescantia 'T. J. Stratton,' 'Congesta.'
Aconitum 'Sparks var.' (d.).
Campanula 'Riverslea.'
Iris 'Lady Chas. Allom' (falls).
Viola odorata.
- Shades. 59'i. **Dauphin's Violet.**
Examples.—*Salvia pratensis* (g.h.), *S. virgata*.
- Tints. 59a. **Light Spectrum Violet.**
Example.—*Anemone apennina*.
- 59b. **Light Violet.**
Examples.—Tradescantia 'J. G. Weguelin.'
Linum narbonnense.
Scabious 'Clive Greaves' (d.).
- 59''d. **Deep Lavender.**
Examples.—*Rhododendron Augustinii* (g.h.).
Aster 'Hermann Lons.'
- 59''f. **Lavender.** K. 478d.
Examples.—Asters 'Cleopatra,' 'Cloudy Blue' (d.).
61. **Amethyst Violet.**
Examples.—Aubrietia 'Dr. Mules,' 'Prichard's A 1.'
Delphinium 'King of Delphiniums' (tones in).
Iris 'Sirius,' 'Albiero' (g.h. falls).
- Shades. 611. **Hyacinth Violet.** O. 192/1-2.
Examples.—*Viola gracilis*.
Iris 'Procyon' (falls).
- 61'k. **Anthracene Violet.** K. No. 501.
Examples.—Lupins 'Happiness,' 'May Queen.'

- 61m. **Fluorite Violet.** K. No. 503. O. 192/4.
Examples.—*Viola* 'Black Knight.'
Clematis Jackmanii (g.h.).
- Tints. 61b. **Hortense Violet.**
Examples.—*Aubrietia* 'Profusion' (striped 61).
Geranium ibericum.
Phlox 'Widar.'
Delphiniums 'Rev. E. Lascelles' (and 57),
'King of Delphiniums' (g.h.).
Iris 'Blue Chintz' (falls).
Wistaria sinensis (g.h., L.).
- 61'b. **Lavender Violet.**
Examples.—*Nepeta Mussinii* (g.h.).
Tradescantia 'Purwell Giant.'
Lavender 'Grappenhall Hall.'
Campanula 'Pride of Exmouth.'
Asters 'Little Boy Blue,' 'Acris,' 'Blue Gem,'
'Blue Eyes,' 'King George.'
- 61'd. **Light Lavender Violet.**
Examples.—*Lupin* 'Lavender Bee.'
Clematis 'Lady C. Nevill' (greenhouse).
Asters 'Lavender' (g.h.), 'Climax,' 'October Dawn.'
Iris unguicularis (g.h.).
- 61f. **Pale Hortense Violet.**
Example.—*Aster* 'Mother of Pearl.'
- 61'f. **Pale Lavender Violet.**
Examples.—*Delphiniums* 'Van Veen's Triumph' (g.h., L.),
'Mrs. Foster Cunliffe' (g.h., shot, 49d.).
- 62'b. **Lavender Violet-Mauve.** K. No. 511 (nearest).
Examples.—*Aubrietia* 'Lavender.'
Asters 'Klondyke,' 'Beauté Parfait,' 'Anita Ballard.'
63. **Violet-Purple.**
Examples.—*Delphinium* 'Millicent Blackmore' (g.h.).
Phlox 'Le Mahdi' (L.).
Aubrietia 'Hon. Lady J. Ward' (d.).
- 63'. **Manganese Violet.**
Examples.—*Delphinium* 'Wales' (and 53).
Phlox 'Iris.'
- Shades. 63i. **Pansy Violet.** O. 190/3 (nearest).
Example.—*Primula* 'Jewel.'
- 63k. **Cotinga Purple.** K. No. 528 (nearest). O. 191/3 (nearest).
Example.—*Clematis Jackmanii rubra* (g.h.).
- 63'k. **Madder Violet.** K. No. 528 (nearest). O. 199/4 (nearest).
Example.—*Lupin* 'Red Star.'
- Tints. 63b. **Amparo Purple.**
Examples.—*Primula denticulata* (g.h.).
Aster 'Margaret Ballard' (L.).
- 63'b. **Mauve.**
Examples.—*Aster* 'Royal Blue.'
Delphinium azureum plenum (g.h.).
- 63d. **Light Amparo Purple.** O. 198/2 (L.).
Examples.—*Asters* 'Sonia,' 'Harold Reuthe.'
Physostegia virginica (L.).
Asters 'Maid of Athens,' 'Countess' (L.).
- 63'd. **Light Mauve.**
Examples.—*Crocus Tomasinianus*.
Delphinium 'Mrs. Visser Hooft' (inner petals).
Asters 'King of the Belgians' (g.h.), 'Empress of Colwall,' 'Dick Ballard.'
Buddleia Davidi magnifica (L.).

- 6j''d. **Hay's Lilac.** K. No. 516 (nearest). O. 198/1.
Example.—Lupin 'Nellie' (with white).

65. **Purple (True).**
Examples.—Primula 'Jewel' (g.h.), 'Julie.'
Tradescantia 'Rosea.'

- Shade. 65k. **Raisin Purple.** O. 191/2.
Examples.—Tones in Iris 'Mildred Presby,' 'Cardinal,'
'Seminole.'

- Tints. 65b. **Phlox Purple.** K. between Nos. 531 and 536.
Examples.—Aubrietia 'Gloriosa.'
Erinus alpinus.
Physostegia 'Vivid' (g.h.).
Asters 'Mons' (g.h.), 'Wm. Robinson,' 'Red
Rover.'

- 65'b. **Chinese Violet.**
Examples.—Honesty (g.h.).
Lupin 'Exquisite' (g.h.).
Tradescantia virginica.
Delphiniums 'Lord Derby' (g.h.), 'Mrs. C.
McIvor' (L.).

- 65d. **Light Phlox Purple.**
Examples.—Aubrietia 'Paul's Pink.'
Liatris spicata and *L. pycnostachya.*
Asters 'St. Egwin,' 'Heather Glow.'

- 65'd. **Lilac.**
Examples.—Delphiniums 'Mrs. Shirley' (g.h.), 'The Shah'
(g.h.), 'Glory' (tones in).
Thalictrum dipterocarpum.
* *Galega Hartlandii* (and white).
Colchicum autumnale.
Aster 'Ronald.'
Erigeron 'Quakeress' (L.).

- 65f. **Phlox Pink.** K. No. 516 (nearest).
Examples.—Phlox 'Bijou Rose' (d.).
Dracocephalum speciosum.
Asters 'Ethel Ballard,' 'General Pershing,'
'Invicta' (d.).

66. **Purple—Rhodamine Purple.**
Examples.—Primula 'Wanda.'
Aubrietia 'Fire King' (g.h.).
Geranium armenum, Merstham var.
Phlox 'Eclairer' (d.).
Gladiolus 'Jacob van Biern.'

67. **Rhodamine Purple.** O. 169/1 (nearest).
Rowney's Water Colour. Magenta.
Examples.—Aubrietia 'Barker's Double' (d.).
Primula lichiangensis.
Allwood's Alpine Pink 'Fay' (L.).
Cistus crispus.
Rubus odoratus.

- 67'. **Magenta.** K. No. 556. O. 182/2.
Examples.—*Rhododendron dauricum* (g.h.).
Common Foxglove (g.h.).
Aster 'Mrs. Chas. Wilson' (L.).

- Shade. 67k. **Dahlia Purple.** K. No. 552 (L.). O. 184/4.
Examples.—Iris, g.h., in falls of 'Betelgeuse,' 'Mrs. Valerie
West.'

- Tints. 67b. **Mallow Purple.** O. 182/2.
 Examples.—*Lythrum virgatum* and *L. roseum*.
Lathyrus latifolius (g.h.).
Rosa Willmottiana (g.h.).
Alpine Phlox atropurpureum (L.).
- 67''b. **Tourmaline Pink.** K. No. 561. O. 186/4.
 Example.—*Sidalcea* 'Interlaken' (br.).
- 67d. **Light Mallow Purple.** O. 189/1 (nearest).
 Examples.—*Androsace primuloides*.
Lavatera Olbia rosea.
Aster 'Barr's Pink' (g.h.).
Chrysanthemum (Pompon) 'Elmiranda.'
- 67'd. **Rose Purple.**
 Examples.—*Clematis Henryi* (L.).
Aster 'Louvain.'
- 67''d. **Laella Pink.** O. 175/1 (nearest).
 Examples.—*Clematis* 'Comtesse de Bouchard' (g.h.).
Daphne Mezereum (L.).
- 67f. **Mallow Pink.** K. between Nos. 541 and 546 (nearest). O. 189/1 (L.).
 Examples.—*Sidalcea* 'Sussex Beauty' (L.).
Aster 'Marjorie.'
 Allwood's *Alpine Pink* 'Moonbeam' (with white).
Rosa amurensis (g.h.).
Delphiniums. The Pink tone in many of the
 'Queen Mary' type—'Queen Wilhelmina,'
 'Hugo Poortman,' 'Mrs. Carnegie,' etc.
Alpine Phlox 'Vivid' (d.).
Phlox 'Camla' (g.h., d.).
68. **Rhodamine Purple. Tyrian Rose.** O. 155/2.
 Examples.—*Rosa nipponensis*, *R. macrophylla*.
69. **Tyrian Rose.** O. 159/3.
 Rowney's Water Colour. Purple Lake.
 Examples.—*Primula japonica* (L.).
Pyrethrum 'Lord Beaconsfield.'
Geranium 'Susan' (g.h.).
Phlox 'Emperor' (d., br.).
Roses 'Lieut. Chaure,' 'Bedford Crimson,'
 'General McArthur,' 'Hadley' (d.), 'Sir David
 Davies,' 'George Dickson,' 'Duke of Edin-
 burgh,' 'Delight' (g.h.), 'Highdownensis'
 (L.), 'Nur Mahal,' 'Eugène Guinoisseau,'
 Dwarf Polyantha 'Alice Amos,' 'Orleans,'
 'Hiawatha' (to white), 'Longworth Rambler'
 (L., g.h.), 'Hugh Dickson' (L.), 'Parfum de
 L'Hay' (br., L.), *Rosa cinnamomea* (L.), etc.
- Shade. 69i. **Amaranth Purple.** O. 168/2 (d.).
 Examples.—*Carnation* Allwood's 'Wivelsfield Claret' (g.h.).
Primula 'E. R. Janes.'
Pæony 'Munitor' (br.).
- Tints. 69b. **Tyrian Pink.** O. 181/2.
 Examples.—*Primula rosea* (g.h.).
Pæony 'Empress Eugénie.'
Cistus × *purpureus* (g.h.).
Dahlia 'Lady Ailecn.'
Roses 'Lismore' (g.h.), 'Elsie Beckwith' (g.h.),
 'Gloire des Mousseuses,' 'Oeillet Parfait,'
 'Burgundica' (tones in).
Dianthus alpinus (L.).
 Oberthur 160/1, 2, 3, 4. Fuchsine.
 Examples.—*Pyrethrum* 'Albert Victor' (T. 4), 'Fairy'
 (T. 2, 3).
Crataegus Oxyacantha (T. 4, dark form).
Phlox 'Mrs. Harkness' (T. 1).
Roses 'J. G. Glassford' (T. 3, 4), 'Victor Hugo'
 (g.h.).

69d. **Amaranth Pink.** O. 182/1.

Examples.—*Aethionema grandiflorum*.

Phlox 'Daily Sketch.'

Geranium Endressii.

Alpine Pink Allwood's 'Wendy,' 'Charming' (L.).

Roses 'La Noblesse' (g.h.), *Rosa lucida rubra* (g.h.), 'Mrs. John Laing' (L.).

69'd. **Pale Rosolane Purple.** O. 154/2.

Examples —Pæony 'Baroness Schroeder.'

Rosa setipoda (g.h., L.).

Lupin 'Pamela' (wings, d.).

Chrysanthemum (Pompon) 'Anastasia' (d.).

69''d. **Persian Lilac.** K. No. 578D. O. 178/3.

Example —*Eupatorium purpureum*.

69f. **Pale Amaranth Pink.** K. No. 546 (nearest). O. 186/1 (L.).

Examples.—Alpine Pink Allwood's 'Tinkerbelle' (on white).

Chrysanthemum (Pompon) 'Elsie Dordans'

Rose 'Marshal Foch' (g.h.).

69'f. **Rosolane Pink.** K. No. 578c (nearest)

Examples.—Peach blossom 'Cardinal,' 'Pitmaston Orange.'

Almond blossom (L.).

Calluna vulgaris Serlei rubra.

Prunus Blirciana Moseri.

Gladiolus 'America.'

Oberthur. 116/1, 2, 3, 4. Carmin de Cochineal.

Examples.—Roses 'Lady Inchiquin' (T. 1, 2), 'D. T. Poulsen'

(T. 2, 3), 'Flamingo' (g.h., T. 1, 2), 'Zephyrine

Drouhin' (L., T. 1), 'Edith Cavell' (T. 2,

full), 'Augustus Hartmann' (T. 1, 2).

Oberthur. 159/1, 2, 3, 4. Carmin Cramoisi.

Examples.—Roses 'Margaret McGredy' (g.h., T. 2), 'Rod-

hatte' (T. 1, 2), 'General Jacqueminot' (g.h.).

70. **Tyrian Rose—Rose Red.** O. 116/2 (nearest)

Examples.—Phlox 'September Glow.'

Rose 'Kirsten Poulsen.'

70'. **Rosolane Purple—Spinel Red.** K. No. 586. O. 168/1 (nearest).

Example.—*Saxifraga Rhei superba*.

Tints. 70b. **Tyrian Pink—Rose Colour.** O. 159/1 (nearest)

Examples.—Roses 'Ulrich Brunner' (g.h.), 'Alfred Columb' (g.h.).

70d. **Amaranth—Deep Rose Pink.**

Examples.—Phlox 'Mrs. M. Van Hoboken' (g.h.), 'Riverton Jewel.'

Rose 'Hermosa.'

71. **Rose Red.** O. 116/3 (nearest).

Rowney's Water Colour. Crimson Lake (near).

Examples.—Carnation Allwood's 'Cerise Pink' (g.h., L.).

Tulips 'Electra' (g.h.), 'Gesneriana Major.'

Phlox 'G. A. Strohleim' (L.), 'Pantheon' (L.).

Roses 'Hortulanus Budde' (g.h.), 'Miss C. E.

van Rossem' (d.), 'Cruss an Teplitz' (g.h., br.).

Saxifraga bathoniensis (g.h., L.).

71'. **Spinel Red.** K. No. 586 (nearest). O. 170/2 (nearest).

Examples.—*Ribes sanguineum* and *R. splendens* (g.h.).

Malus x purpurea (g.h.).

Malus floribunda (g.h.).

Escallonia Ingrami and *E. macrantha*.



FIG. 103 - PRUNUS SUBHIRTELLA.

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FIG 104 — JAPANESE CHERRY 'KOJIMA'

71b. **Rose Colour.** O. 116/1.Examples.—*Spiraea callosa* 'A. Waterer.'

Phlox 'Mme. P. Dutrie' and 'Mrs. A. Baker.'

Armeria 'Bees' Ruby.'

Tulip 'Princess Elizabeth' (g.h., L.).

Roses 'Souvenir de Georges Pernet' (g.h.), 'Una Wallace' (g.h.), 'Madge Wildfire' (g.h.), 'Lanei' (g.h.), 'Burgundica' (tones in), Sweet Briar 'Anne of Geierstein,' Moss 'Eugène Verdier' (g.h.).

71'b. **Spinel Pink.** O. 157/2 (nearest).

Examples.—Buds of double-flowering Peach.

Diclytra spectabilis.*Saxifraga Aizoon rosea* (g.h.).

Roses 'Dame Edith Helen,' 'Charles P. Kilham' (g.h.).

71''b. **Rocellin Purple.** K. No. 591. O. 178/4.

Example.—Lupin 'Cross Roads.'

71d. **Deep Rose Pink.** O. 154/3 (nearest).

Examples.—Phlox 'Riverton Jewel' (g.h.), 'Elizabeth Campbell.'

Roses 'Mrs. G. Shawyer,' 'Lady Ashtown,' 'Radiance' (g.h.), 'La France,' 'Clovelly' (g.h.), 'Mrs. R. G. S. Crawford,' 'De Meaux,' 'Rosa villosa,' 'Louis Odier,' 'Dorothy Perkins,' 'Blush China,' 'Dean Hole' (flush on cream), 'Ethel James' (flushed).

71'd. **Thulite Pink.** O. 152/1 (nearest).

Examples.—Peach 'Humboldt.'

Daphne Cneorum (g.h.).

Rose 'Dainty Bess' (outsides of petals).

Ribes roseum (L.).71f. **Rose Pink.** K. No. 571 (nearest). O. 154/1 (nearest).

Examples.—Peach blossom 'Goshawk,' 'Rivers' Early York,' Pyrethrum 'E. M. Robinson,' 'Margaret Moore' (L.).

Rosa glutinosa (g.h.), Roses 'Caroline Testout' (g.h.), 'Cl. Lady Waterlow' (g.h.), 'Grahams-town' (g.h. with white).

Tulip 'Massachusetts' (g.h.).

71'f. **Cameo Pink.**

Examples.—Lupin 'Pamela' (keels).

Saxifraga Irvingii.

Rose 'Dainty Bess' (insides of petals).

Oberthur. 150/1, 2, 3, 4. Rose poupre.

Examples.—*Crataegus Oxyacantha*, Double Pink.

Phlox 'Mrs. E. Campbell' (T. 2).

Roses 'Dame Edith Helen' (T. 2, 3, br.), 'Ellen Poulsen' (T. 4), 'Mrs. A. R. Barraclough' (T. 2, 4).

Oberthur. 119/1, 2, 3, 4. Rose Neyron.

Examples.—Phlox 'Thor' (T. 2, 3), 'Gen. von Heutz' (T. 4, g.h.).

Schizostylis 'Mrs. Hegarty.'

Roses 'Isobel' (T. 2, 3, 4), 'Picture' (T. 1, 2, 3, 4), 'Mme. Abel Chatenay' (T. 1, 3), 'Betty' (tones in), 'Laurette Messimy' (T. 1, 2, full), 'Henrietta' (T. 3, g.h.), Sp. 'Koenigen von Denmark' (T. 2, 3, g.h.).

Oberthur. 120/1, 2, 3, 4. Rose Nilsson.

Examples.—Roses 'Salmon Spray,' H. poly. (T. 1, 2, 3, 4).

FLOWERING CHERRIES.

By R. C. NOTCUTT, F.L.S., and R. F. NOTCUTT, B.A.

[Read June 4, 1935; Dr. WILFRID FOX in the Chair.]

THE flowering Cherries have been cultivated in Japan from time immemorial. Certain double forms are known to have existed in the Nara Period, over 1000 years ago, and references in Japanese manuscripts go back several centuries. One important work is dated 1681, and among the forty varieties mentioned in this manuscript, twenty-one are known to be in existence to-day. One well-known variety familiar to many, the double-flowered 'Fugenzo' ('James H. Veitch'), was certainly grown in Japan over 500 years ago.

It seems that about the year 1800 the number of varieties of Cherries was at its highest, and about this time a large collection was made at Kyoto under the direction of the reigning Emperor. Unfortunately many of these Cherries were afterwards scattered, with the resulting loss to horticulture at the time, and later giving rise to confusion owing to vague legendary records of various varieties. Some of them later reappeared under entirely new names. In this way great confusion in nomenclature arose, and it is due to the painstaking work of MIYOSHI, E. H. WILSON, and COLLINGWOOD INGRAM, that some order is now being gradually restored among the various varieties. Mr. INGRAM, who has spent some time in Japan, and has studied and worked out the Cherries with the Japanese themselves, is one of the greatest authorities at the present day. We are greatly indebted to his work and to his willingness to put many varieties on the market. A host of Japanese names still remains to be sorted and many will be discarded. Some Cherries have a string of synonymous names which occasionally crop up or are seized upon by some enthusiast claiming to have found an entirely new variety. It is the duty therefore of everyone interested in Cherries to keep to the recognized name and discard all other names.

In Europe the first mention of the oriental-flowering Cherry in literature is by KAEMPFER in 1712, who describes three varieties. Later five more varieties were described by THUNBERG and SIEBOLD. The first record of any introduction to England appears to have been in 1822, when SAMUEL BROOKES, a nurseryman at Newington Green, received a double white-flowered variety which was described as *Prunus serrulata*. This leads us to mention the botanical relationship of the Japanese Flowering Cherries, which has been insufficiently explained and elucidated.

Most of the garden varieties of the Cherries have apparently been derived from two wild species, which have been named *Prunus Lannesiana* and *P. serrulata*. The differences between these two species are

so small and slight that with most garden varieties of Cherries it is quite impossible to say with certainty to which species they belong, and this is admitted by the leading authorities. The differences between these two lie in such small points as the shape of the marginal teeth of the leaf. In *P. Lannesiana* they are like long bristles, while in *P. serrulata* they are short. It really does not matter horticulturally to which species many of these beautiful flowering Cherries are assigned and the leading authorities are inclined to ignore the point. The majority of the varieties have no correct Latin name, but have simply the Japanese name for their designation. This would be simple if there were not as well a number of synonymous Japanese names. It is often difficult to settle definitely the name by the law of priority, especially as there is sometimes doubt if two names regarded as synonymous really refer to the same plant.

The Japanese, who regard so many of their plants from an entirely aesthetic point of view, care little about the complication of nomenclature, and like to bestow on many of their trees names describing their beauty and effect, often in endearing terms. The meanings of many of the names are both poetic and delightful, as for example, Ojochin, "Large Lantern"; Fugenzo, "A Goddess on a White Elephant"; Shogetsu, "Moon hanging low by a Pine Tree." It is small wonder therefore that the flowering Cherry is regarded as a national inheritance, so much so that there is a national holiday at the time when the Cherry blossom is at its best, and many in all stations of life make an annual pilgrimage to the more famous groves and plantations. The district of Yoshino is the most famous, but there are other places in the country with fine collections, especially near Tokyo.

CULTIVATION.

The flowering Cherries are extremely kind plants to grow, and will establish themselves in almost any sort of soil, but they thrive best in a good deep well-drained loam. At the same time, they will flourish more or less happily in an acid peat soil, and in light sandy land. For the last it is advisable to select the strong and vigorous varieties such as *P. Avium* fl. pl., 'Kanzan,' and *serrulata rosea* ('Hokusai').

Like their fruiting relations, the Cherries enjoy a certain amount of lime in the soil, and if the soil is naturally deficient, it should be added in some form. Well-decayed manure is also invaluable, especially where the soil is light or poor. When the trees are once established, they resent having their roots disturbed, and it is only necessary to fork over the ground around them very lightly and keep it clear of weeds and rubbish.

As to planting, like most deciduous trees, this is best done in the autumn, as soon as the leaves have fallen, and if this period is missed, they can also be quite well transplanted in February and early March, but should the land be porous, there is a chance of their being retarded by drought in the early summer.

Trees can be procured as standards or as bushes, but in many cases the former are preferable, as they show off the beauty and grace of the mature tree better than a bush plant. This particularly applies to varieties with a weeping tendency, such as *longipes* and 'Fugenzo' ('James H. Veitch'), and to the true pendulous growers such as *rosea pendula* ('Cheal's Weeping'). A young tree three or four years old, with 5-6 feet clear stem, is the best size and age to plant. Once planted and carefully staked, there is little more to be done, as the Cherries resent much cutting, and the less they are pruned the better. When it is necessary to shorten back straggly branches to keep a tree shapely, it is best to cut them in late September, before the leaves fall.

As in their native country, the Japanese Cherries make excellent trees for roadside planting, and this has been much taken up in this country through the Roads Beautifying Association, who have recommended and planted these trees most attractively. Where there are narrow margins along roads, the upright-growing varieties are, of course, the best to plant, and the double pink 'Kanzan' is much used for this purpose.

As to propagation, in most British nurseries the Cherries are budded and grafted on to the wild Gean, *Prunus Avium*, and this has proved to be quite the best stock in this country. Recently we inspected a large collection of flowering Cherries which had been sent direct from Japan. The trees had been planted some five or six years, and had grown very little during that period. It seems that they had been grafted on a Japanese stock, which does not suit our conditions. Mr. INGRAM has tested this question, and he has trees growing side by side, the one on the native Gean and the other on a foreign stock, and although they have all been given the same treatment, the difference in vitality is most noticeable and much in favour of the Gean.

PRINCIPAL VARIETIES.

Prunus subhirtella autumnalis (*P. Miqueliana* of some lists).—This variety is the earliest to flower of all the Cherries, and it blooms in Britain in November, and has a second crop of flowers just when the foliage buds are breaking. This remarkable winter-flowering Cherry makes a somewhat bushy tree with thick interwoven branches, up to 20 feet in height (one of the largest trees at Borde Hill is considerably more, and nearly double as wide).

The flowers are slightly semi-double, white or faintly tinted with pink and are borne on the bare branches. Curiously those produced later in the spring show somewhat more colour. The maximum show of blossom is often in late December, and if weather conditions permit it is always possible to cut a few sprays on Christmas Day in Suffolk, but if there is much frost the blossoms are damaged. There is afterwards a lull in the blossoming until a few flowers are produced in early spring, when the leaves are breaking.

The Japanese name means October Bloomer.



FIG 105 - JAPANESE CHERRY 'TAI HAKU'

[To face p. 350.



FIG 106 - JAPANESE CHERRY 'OJOCHIN.'



FIG. 107 — JAPANESE CHERRY 'AMANOGAWA.'



FIG. 108 - JAPANESE CHERRY - SHIRO-KOJI

Prunus subhirtella. Higan or Equinox Cherries.—The first Spring Cherry of Japan is not found in the wild state but is much grown in that country. It is not a large tree, seldom exceeding 20–24 feet in Japan, and at present smaller in Europe and America. The branches are spreading and form a flattened, rounded head of closely massed branches.

Flowering well before the foliage, from March to mid-April, the blooms are light pink, up to 1½ inch across. They are a deep reddish-pink in the bud, fading as the flowers open, but retaining a pinkish-purple zone in the centre of the flower, and on the calyx. The tree becomes very floriferous with age, but is sometimes a little shy in the young state (fig. 103).

Prunus subhirtella ascendens.—The wild form of *P. subhirtella*, found in Japan, Korea and China, where it undoubtedly forms a large tree.

In Britain it is characterized by its erect growth. The flowers are similar to *P. subhirtella*, sparsely produced in the young state, but becoming far freer with age.

Prunus subhirtella pendula. 'Shidare Higan.'—The weeping *subhirtella*, or weeping Rosebud Cherry, is well known and popular in Japan, and has been cultivated for many years, as illustrated by some of the old trees existing to-day, and the legends and stories regarding other specimens.

Various forms of this Cherry exist, and notably there is an upright pyramidal type with pendulous branches and also the flat-topped pendulous form. The flowers are small, bright carmine in the bud and opening to a rosy-pink. The blossoms are very freely borne in pendulous loose corymbs.

There is a celebrated tree outside a temple near Kyoto. The mighty Hideyoshi—the so-called Napoleon of Japan—it is supposed, sat under the branches of this tree, but there is reason to believe that the tree existing to-day was planted at a later date, on the site of the original specimen.

Prunus yedoensis. 'Yoshino.'—One of the most popular of all in Japan for parks, street planting, and cemeteries, and existing in large numbers near Tokyo. It is not, however, found growing wild, and it has been suggested that it is of hybrid origin—*P. serrulata* × *P. subhirtella*. The flowers, produced in clusters of three or four, are single, very pale pink or nearly white, 1 inch or slightly more in diameter. The calyx is covered with tiny hairs and is slightly viscid. There is a faint scent. The foliage is faintly tinged in the young state, but expands to a bright green.

The charm of this Cherry is its early season of blooming, and it is one of the first Japanese Cherries to flower after the 'Higan' (*subhirtella*) kinds, and the blossom is thus seen on the leafless branches.

Prunus Sargentii. (*P. serrulata sachalinensis*).—One of the finest of the flowering Cherries for cultivation in Britain. It is unique because of the wonderful autumnal colouring of the foliage, when the whole plant

changes to red and finally the most brilliant vermillion. It is found growing wild in Japan at a high altitude, and apparently grows to 40-60 feet in height.

The flowers are single, early flowering, a clear pink, about $1\frac{1}{2}$ inch across, borne in short-stalked clusters of three or sometimes four. The young foliage is richly coloured bronze in the young state, gradually changing to green.

There are many varieties recognized by the Japanese, giving rise to eighteen described forms, and some of these are possibly in cultivation in this country.

Prunus 'Fudan-zakura.'—The merit of this Cherry is its early season of flowering, since by the middle of February, in a favourable year, it should be starting to blossom.

The flowers are single pure white, with pale pink calyx, and slightly coloured petals in the bud state. The flowers are naturally produced on the entirely bare stems and branches.

At the season of flowering this Cherry responds readily to forcing in the house and sprays cut in bud open attractively indoors, and for this reason it is well worth growing.

The name means Continuous Cherry.

Prunus 'Hokusai.'—Known in the trade as *P. serrulata rosea* and *P. nobilis*. There seems to have been some uncertainty as to the correct name of this, one of the commonest and most beautiful of the Japanese Cherries. It has been grown in Europe for over fifty years, and some large trees now exist in England. One of the largest is in Mr. INGRAM's garden at Benenden, where there is a tree about 25 feet high with a diameter of over 40 feet.

The light pink blossoms, deeper in colour in the bud, open to a clear soft shade, with semi-double flowers, usually with 10-12 petals and about $1\frac{1}{2}$ inch in diameter. The flowers are about at their best the last week in April.

There are a few semi-double pink Cherries very similar in appearance, and one variety often seen is *P. nobilis*, which shows little difference from the above, apart from a minimum number of fifteen petals in the flower.

Prunus 'Kojima.' (Syn. 'Sirotae' and 'Mount Fuji') (fig. 104).—One of the finest single whites, making a large spreading tree, with a tendency in the young condition for its branches to grow out somewhat horizontally.

The blossoms are arranged in long-stemmed pendulous corymbs, up to five flowers in each. The individual flower is large, 2 inches across, of pure dazzling snow white, and the shape of the corolla is inclined to be campanulate.

The foliage is clear bright green. It is a beautiful variety, well meriting its inclusion in a collection, and one of the finest pure whites with no trace of colour.

The name refers to a legendary Japanese warrior.

Prunus 'Tai-haku,' certainly the largest of the white single Cherries. We are indebted to Mr. INGRAM for introducing this beautiful Cherry, which, in addition to its large single white flowers, has a most

attractive bronzy hue to the young foliage. It seems to be a good grower, and I think will make one of the finest garden Cherries. Mr. INGRAM tells us a romantic story about it : how, when he was in Japan, he had an interview with Mr. FUNATSU, a man who had spent the whole of his life in the cultivation of Cherries. At the end of Mr. INGRAM's visit, as a sort of finale, Mr. FUNATSU brought from his storeroom of treasures and family heirlooms an old hanging picture which had been painted by his great-grandfather 130 years before. This he carefully unrolled and to Mr. INGRAM's great surprise it truthfully depicted a large single white Cherry, which apparently had been lost to Japan, but which Mr. INGRAM at once recognized as one he had growing in his garden in England (fig. 105).

Prunus 'Ojochin.' (Syn. 'Senriko.')—Great confusion has existed over the name of this variety which was first shown in 1924 by us, when it received an Award of Merit under this name, which has been confirmed by Mr. INGRAM.

It is one of the largest-flowered, pale single pinks, having flowers quite single, and about 2 inches across. The buds are of a pronounced pink, and the flower opens blush, fading to a flushed white when mature. The young flower buds are almost round before expanding (fig. 106).

The meaning of the word 'Ojochin' is "Large Lantern."

Prunus Sieboldii or *Watereri*. 'Taksago.'—One of the older Cherries, being introduced to Europe in 1864 by SIEBOLD, and this and many forms separated by the Japanese as named varieties, have long been grown in nurseries in Europe and America.

It is sometimes met with under the Japanese name 'Naden,' a variety which is very similar, although some authorities claim that it is distinct. It is fortunately a Cherry that can always be recognized on account of the dense pubescence on the flower stalk (seen quite clearly with the naked eye) and on both surfaces of the leaves, thus making one of the few cases of identification possible when the plant is out of flower.

The flowers are pale pink, fairly large, and semi-double, usually appearing with the leaves, which results in somewhat diminishing its beauty. When fully out there is a development of a deeper pink zone in the centre of the flower, which is more marked in this than in most varieties.

The Japanese name refers to a classical song, praising the then mythical island of Formosa.

Prunus 'Yedo-zakura' or 'Hosokawa-beni,' a variety little known in the trade, forms a small tree remarkable for its great floriferousness, which results in the whole length of the branches becoming globular masses of blossom, often curtailing the growth. Flowers deep rose-pink in the bud, opening to a lovely shade of soft pink.

Known in a number of closely allied forms in Japan.

Prunus erecta. 'Amanogawa.'—A remarkable variety, with erect fastigate growth, almost resembling a Lombardy Poplar. The clusters of flower are produced in upright bunches of single pale pink flowers borne close to the stem so that the plant becomes a pillar of

flower. The flowers are large and slightly scented, usually quite single (fig. 107). This Cherry is unique, and can be planted to effect in positions needing an erect sentinel tree.

The Japanese meaning of the name 'Amanogawa' is "Milky Way."

Prunus Ukon.—There are three varieties of Cherries with flowers of a yellowish tinge to the petals, or possibly more correctly an ivory yellow. All these are very similar in flower colour, but there is a difference in constitution and growth amongst them.

The best variety and most likely to be seen and grown is 'Ukon' (syn. *serrulata grandiflora*), which is a strong grower, and is possibly better grown as a bush tree than a standard, forming long branches, sometimes apt to straggle.

The flowers are freely produced in large clusters, and the blossoms are large and semi-double, white suffused with greenish-yellow when first opened, but losing the yellow tinge when mature and fading. The foliage is bronze-tinted when first unfolded, but this is lost with growth, and the full-grown leaves are an ordinary green, with a tendency sometimes to become very large.

The other two varieties with yellowish flowers are 'Asagi' and 'Gioiko.'

Prunus Conradinae semi-plena.—The semi-double variety of an early-flowering spring Cherry of China. It forms a handsome, strong-growing tree, with attractive bronze-tinted foliage in the spring. The flowers are clear pink, fading to pale pink when expanded, and borne freely on the bare wood in clusters of three to five. This Cherry flowers remarkably early, and in some years in February. We are indebted to Mr. INGRAM for its introduction.

Prunus campanulata.—A very beautiful Cherry from Formosa with the brightest and deepest coloured flowers of any, the blossoms being a deep rose red. Unfortunately this Cherry is not hardy and it must be regarded as a cool-house plant except in the warmest counties. The flowers are elongated, with a bell-shaped mouth to the corolla.

Prunus pilosiuscula media.—A species from China, making an erect-growing bush of stiff habit. The flowers are borne in close clusters of two to four in early April, and have a tubular white corolla from which protrude numerous bristling stamens giving the Cherry the title of 'Bearded.'

Prunus 'Botan-zakura.'—A little-known variety, seldom listed in the trade of this country, and scarce in Japan where this kind is known as the Pæony Cherry. It is a large pale pinkish-white flower, nearly 2 inches in diameter, but is definitely pink in the bud. The plant is extremely floriferous, but is not a strong-growing tree.

The name is derived from the supposed likeness of the flower to that of the tree Pæony ('Moutan'), a name which has even been given to it.

Prunus 'Mikuruma-Gaeshi.'—A scarcely known Cherry in this country, but one with a great history in Japanese mythology, the name referring to an ancient legend: One of the early Emperors was



FIG 109 - JAPANESE GARDEN AT HUNTINGTON MUSEUM



FIG. 110.—ORCHID SHOW PASADENA, MARCH 1935

so impressed by the beauty of a certain flowering Cherry that he ordered his carriage to return to the spot that he could once again see the tree. Hence the name: "The Royal Carriage returns."

All stock of this Cherry is supposed to have been derived from this tree.

The flowers are single, of a light pinkish white and extremely thin, light texture, so much so that the underlying sepals can be seen as a dark band through the petals when the flowers are viewed from beneath.

Prunus incisa.—The Pigmy Cherry is usually seen as a small bush, thickly branched, but in time it will grow to quite a large bush 12–15 feet high. It is extremely ornamental and very free, with its small pale pink flowers and deep pink calyx and buds. The calyx is extremely persistent and remains well after the petals have fallen.

It is much used by the Japanese for dwarf trees, and lives well in tubs and pots.

Prunus Avium fl. pl. The 'Double Gean.'—One of the finest of the Cherries, making a good strong-growing tree, valuable for street and park planting. The 'Double Gean' is not a Japanese Cherry, and has been known and grown in Britain for upwards of two centuries.

The flowers are double white, borne in great profusion and the flowering sprays are wreathed with blossoms from end to end. The flowers are completely double, about $1\frac{1}{2}$ inch across, and consist of thirty or more petals. The flowering period is later than many of the Japanese varieties.

Prunus rosea pendula. Cheal's Weeping Cherry, also called 'Shidare-zakura' and 'Lidara Nova.'—One of the showiest and largest flowered of the weeping Cherries, and long cultivated in Britain, although curiously enough it is not known in Japan.

Of definitely pendulous habit, the branches are somewhat sparse and irregular, but the flowers are produced with great freedom in closely packed clusters. The blooms are very double and of a delightful deep pink.

Prunus Yoshino pendula.—The pendent variety of 'Yoshino,' which forms a tree with a strictly weeping growth. The flowers are similar to those of the type 'Yoshino,' but possibly a little smaller.

Prunus longipes. 'Oku Miyako.'—A beautiful double white Cherry, and one of the latest to flower, lasting to the middle of May, or even later.

It forms a tree with a large flat-topped crown. The foliage is bright verdant green, even when first unfolded, and the margin has a sharply toothed edge. The double flowers are pale pink in the bud, opening to a soft paper-white, showing a distinctly frayed margin of the petals. The flowers are borne in clusters of 4–6 flowers, and the stalks are exceptionally long stemmed, forming pendulous clusters which can be well seen when looking up into a tree.

This variety, and 'Shiro-fugen,' are the latest Cherries to flower in this country.

Prunus 'Shiro-fugen.' *P. serrulata alba rosea*.—A strong vigorous tree, up to 20-25 feet in height, with a large spreading head. The young foliage, when first expanded, is a rich mahogany brown, becoming greener with age, and the flowers are produced when the foliage is well expanded. The many-petalled double flowers are beautifully shaped, pale pink in the bud, opening to creamy white and becoming pale pink and zoned in the centre with a purplish pink before falling. It is one of the last Cherries to flower, and makes a companion to *P. longipes*, from which it differs by the bronze-tinted foliage, pinker flowers and smaller flower clusters (fig. 108).

The name 'Shiro-fugen' means "White Goddess."

Prunus 'Sekiyama' or 'Kanzan.' (Often wrongly called 'Hizakura' in nurseries.)—This Cherry is one of the best, and naturally has become very popular. It has strong erect growth, is very hardy and free flowering. It is thus one of the best varieties for roadside, avenue, and park planting, and is effective in positions where a single specimen is needed. The flowers are a beautiful rich pink, deeper in colour, almost rose-red in the bud, and fading somewhat with age, but always retaining the clear pink colouring. The blossom is double, and the usual number of petals is about thirty, far more than in most semi-double varieties. A second asset is the beautiful coppery red hue of the young foliage, which opens just at the time the blossom is appearing, so providing a striking and lovely combination of bronze and pink colourings.

There has been great confusion over the correct name, and unfortunately in British (not American) nurseries, it has been grown and distributed as 'Hizakura.' This name is entirely wrong, and refers to a beautiful soft clear pink single variety, quite distinct and not nearly as robust a grower as 'Kanzan.'

Prunus 'James H. Veitch.' 'Fugenzo.'—A well-known and popular Cherry, and one of the most loved and prized in Japan, where it has been known for more than 500 years.

The flowers are double, salmon pink, similar in colour to those of 'Kanzan,' but 'James H. Veitch' flowers a week or two later, and the blossoms are tighter and not quite so large. Further, this Cherry makes a rounded tree with a thick network of branches. It is among the latest to flower, an average time being the end of the first week in May.

The poetic Japanese name has a picturesque meaning, "A Goddess on a White Elephant."

Prunus 'Beni-fugen.'—A distinct variety, although sometimes confused with 'James H. Veitch' on account of the similarity in colour of the flowers.

The foliage is clear green, even when first unfolded, thus differing from the bronze young leaves of its close ally.

The flowers are smaller and tighter in appearance than those of 'James H. Veitch.' Little is known of its habit when old, but it seems free in the young state, although not fast in growth.

CALIFORNIAN JOTTINGS.

By Viscountess BYNG OF VIMY.

(Continued from p. 317).

BUT the Succulent Garden is only one, if the most important part, of the lovely grounds which surround the Museum and Library where the late Mr. HENRY HUNTINGTON housed his far-famed collection of manuscripts, books, porcelain and, above all, well-known pictures, which our own tax-crippled countrymen have been forced to part with. Here you find these treasures admirably hung and lit, free for the public who flock there to enjoy them. Gainsborough, Romney, Raeburn, Crome, Constable, examples, too, of the Italian schools, all of the very best, and many of them familiar to oneself in old days in the houses of friends. The house and museum stand in the centre of the gardens that Mr. HERTRICH in the past thirty years has created; wide lawns sweep away on all sides, planted with shrubs and trees, all admirably labelled. It is only by unceasing care that the lawns are kept in such wonderful condition, and Mr. HERTRICH told me that when all the sprinklers are fully on the amount of water put on to the garden is one thousand gallons a minute!! Among the trees and groups on the lawn near the house are a fine example of *Agathis robusta*, some 80 feet in height, a delightful clump of *Ulmus parvifolia*, with the fresh pink-tinged tips of new foliage just showing, and *Taxodium mucronatum* from Mexico, shedding its foliage in a bronze carpet and at the same time replacing it with a new crop. A grand specimen of *Persea gratissima* from Guatemala companions the Agathis. These trees are largely grown in orchards for the fruit all over Southern California. *Magnolia Soulangeana* with *Raphiolepis umbellata* is abundant, while *Pittosporum undulatum* and *P. Tobira* scent the air and afford shelter for the delightful little valley quail that abounds. *Erythrina caffra*, the South African Coral tree, is coming into bloom, and away below the lawns stretch Orange and Lemon groves through which runs a cool, shaded drive. About the grounds are marble temples, bronze statues, fountains, and in a little enclosed garden the loveliest well-head of wrought-iron vines and bunches of grapes. There is just the right number of these things and so admirably placed that you feel they are exactly the right note in the right place.

Leading away from the house towards the Japanese Garden come Roses in set beds, and high pergolas of every kind of *Lonicera* that in a few weeks will be a mass of bloom. From here the ground falls sharply to a gorge, with pools and a little stream spanned by a red lacquer bridge. On the steep bank opposite stands a Japanese tea-house smothered in pink *Wistaria*, and approached by a pergola of mauve and white *Wistarias*. The banks are covered with Japanese *Azaleas*, *Camellias*, specimen dwarf and golden Conifers, and spreading masses of prostrate *Juniper* that edge the stream where *Irises* and

Calla Lilies abound—and though the latter are rather despised out here, they stop short of calling them “Pig Lilies” as they do in South Africa! Another lovely and secluded corner near the house lies under the shade of spreading Ilexes, where the air is heavy with the scent of *Daphne odora* and *D. odora variegata*; *Begonia heracleifolia* carpets the ground, and dwarf Japanese Azaleas blaze in every shade of pink, salmon and crimson; *Aralia monstrosa* rises 12 feet or more; *Jacobinia obtusa*, Hedychiums, and the homely old *Hypericum elatum* are there; *Fatsia japonica* with its glossy foliage reflects the broken sunlight, and *Moraea iridioides*, *M. Johnstonii*, and others of the same family display their delicate blooms; and there too are *Cytisus maderensis*, Belladonna Lilies in immense clumps, and a thousand other things that I have forgotten to name. In the darkest corners spread feathery masses of *Asparagus plumosus*, *A. Sprengeri*, and the taller-growing *A. virgilis* covered with little red berries. In and out of this lovely shaded retreat flit vivid blue jays, the small blue-bird, and innumerable others that are strangers to me, whilst with spring advancing rapidly the mocking bird’s clear note is insistent, doves are cooing their spring song, and quail clucking in the undergrowth, so that the place is a paradise, where, by the kind permission of Mr. FARRAND the Curator and that great garden craftsman Mr. HERTRICH, we have had free access at times when the public are not admitted to this retreat of peace and beauty.

Next comes a totally different type of gardening. At a small but very good Orchid show early in January, I met Dr. H. EVERSOLE, who, having lost his health in magnificent war and post-war work, has now turned his scientific and chemical knowledge to the growing of Orchids. Until ill-health befell him flowers meant nothing to him, and when his doctor insisted on a quiet life and suggested mild gardening as a suitable recreation he was met with a flat refusal. However, this wise doctor hit on the idea of building a small greenhouse, away from the living house, into which he introduced a few ordinary plants. But the patient sniffed and turned an obstinate back on the greenhouse. However, one day happening to want a wrench that had got into the hated spot, he went in and saw a sickly-looking plant—he began to take notice. One plant he saw had pernicious anæmia, another gout, and so his medical interest returned in a desire to aid the ailing plants, and he began to doctor them, since he could no longer doctor human beings. From these beginnings he applied his great knowledge of chemistry to working on the requirements of Orchids, the possibility of treating them with mineral compounds, the question of correct proportion of light in relation to feeding and also of humidity; the method of regulating the temperature automatically, and above all, the question of shortening the time between germination and the adult stage, as well as that of increasing the blooming powers of individual plants. The first time I went to “The Boulders” I sat for two hours with Dr. EVERSOLE and listened to his theories, feeling like a very small tadpole swimming in a very big tank and trying to



FIG. 111. ORCHIDS IN AIR-CONDITIONED HOUSE AT THE BOULDERS,
LA CANADA, CALIFORNIA



FIG. 112 ---CATTLEYS IN PURE QUARTZ SAND AT THE BOULDERS
(Third blooming season of those numbered)



FIG. 113. *CUPRESSUS MACROCARPA*—A VETRAN.



FIG. 114. — THE DWARF BLUE LUPIN, *LUPINUS NANUS*, IN CALIFORNIA

keep its head above the flood of knowledge in scientific chemistry that flowed round me. I did manage to absorb a little of what he told me, and I also secured from him a copy of his letter to the Orchid Society in America from which I will now quote :

" My chief interest remains in their (Orchids) chemical demands in relation to light intensity, heat, humidity. I find that *Phalaenopsis* hybrids respond to chemical stimulation under proper conditions very gracefully ; as, for example, several series of *P.* ' Gilles Gradiot,' *P.* ' Elizabeth ' and other white hybrids which all flower in eight to thirteen months from the incubator, four to six flowers to the stem. These series, like most of my experimental plants, are grown in pure quartz sand and direct from the incubator, with distilled or pure rain water and chemicals. The control series were grown in the usual way, in fibre, and are still only in thumb pot size with no sign of flowers.

" The work with *Odontoglossum* and hybrids began last year, with 200 adult plants from Charlesworth, England. Until I have seedlings to work with, the problem must be confined to growing them in the usual fibre, which adds difficulties, because the chemical composition of fibre varies in almost every bundle. Later, when I have seedlings to work with, I hope to run a series in quartz sand as I have the other species. The professional growers here, who have been watching the work, especially with *Odontoglossums*, are very much interested in the fact that the bulbs I have grown are one-eighth to one-half larger than any of those on the plants when they arrived from England. They are interested too in the very dark green, hard foliage in relation to the great amount of light intensity I give the plants. The flower spikes, number and size of flowers leave nothing to be desired, say those who know. I don't."

It was the extreme healthiness and florescence of his plants which raised my interest at the Orchid Show—and led to an acquaintance which has taken me into bypaths of great interest in more ways than Orchid growing. Dr. EVERSOLE is a man who shuns publicity, seeks no reward for his labours on this most interesting subject, but is eager to give his help, both in chemistry and engineering, to any private person who desires to profit by his experience. He, however, refuses to consider the commercialization of his ideas or inventions, and at the present moment will not give the formula of his mineral food treatment of the plants until he has worked out a light intensity registering instrument to govern the operation of the shades on the houses, and of automatically controlling light intensity in relation to chemical stimulation of plants on a scale sufficiently large to be of practical value in testing his theories. Theories, not even his own, do not interest him beyond the extent of their practical application for growers in general. If his theories are correct, and can be made more or less mechanically automatic, then he believes that Orchids will be grown with chemicals, in a manufactured, inert, non-absorbent material simulating natural fibre in consistency, permitting normal root development. Root development is not normal,

as to form, in any heavy, hard quartz sand or gravel. He is working on such a synthetic material, but practical results are still only in the offing. In his two houses, the one heated, the other cold, Dr. EVERSOLE has installed a system of air-conditioning which works automatically, thus saving labour and reducing the cost of fuel. Everything is controlled by thermostats and humidistats—even the ventilator on the top of the house—so that they are completely air-conditioned and the element of human carelessness or ignorance is eliminated. He maintains that it is essential for the well-being of the plants that their feeding should be rationed in proportion to the light intensity given them, for he holds that light to the plant organism is equivalent to exercise to the human organism, and should therefore be rationed accordingly. As regards results up to date, the accompanying picture (fig. 110) show the sprays that he used at the exhibit he put up at the Pasadena Orchid Show early in January, which are still unfaded and fresh, on the plants to-day (March 2). Another photograph (fig. 111) well worth studying is that which shows the Orchids and the pan of *Spathiphyllum Clevelandii* in the air-conditioned house. The healthiness of Dr. EVERSOLE's plants, their robust foliage, floriferousness and freedom from insect pests are striking proofs of the success of his methods, and his future experiments should be of supreme interest and value to all Orchid growers.

From the sophistication of Dr. EVERSOLE's Orchids I drifted to the Colorado Desert, 120 miles to the south, for a couple of nights, to Palm Springs, one of those mushroom growths which shoot up at a moment's notice all over California. It consists of a main street, two hotels, one simple and pleasant, the other just the reverse, and patronized by a noisy crowd, but I escaped both, and stayed with friends in a little adobe house, one of a small group in a compound full of Orange, Lemon, Grapefruit trees, and a sprawling grey-stemmed Fig that overhung the wall on to the main road. All around Palm Springs lies the Colorado Desert—grey, vast, studded with low bushes and tiny flowers that need close search, such as *Mohavea confertiflora*, an attractive 6-inch annual, with a cup-shaped bloom of palest yellow, spotted and streaked inside with brown and having an odd little involucrate opening on the ventral side, that makes it look like a topsy-turvy *Antirrhinum*. The ground was thickly carpeted with *Abronia villosa*, and gay with 2 to 4 foot bushes of *Encelia californica*, thickly powdered with golden flowers. *Cleistoyucca arborescens* (Joshua tree), towering up 30 feet, is endemic to the Colorado and Mohave Deserts, and gained its name because the early settlers thought its curiously distorted branches pointed towards the "Promised Land," or were uplifted, like Joshua's arms, in prayer. The fruits which follow the coarse creamy-white flowers are yellow in colour and eaten by the Indians, who utilize the coarse fibre of the stem for making baskets, ropes and hats, and they also get a pulp from the stem, of which they make soap—not that I have often met an Indian who showed any eagerness to use soap on his person! As a

specimen of plant life the Joshua tree is interesting, and even has rugged beauty when you see it massed on the grey surface of the desert and accompanied by groups of *Opuntia fulgida* or "Cholla" (pronounced Choya), a mass of forbidding spines and with magenta-pink flowers. Owing to its armament this is not a popular plant, for it sheds these spines so plentifully that the Indians declare they fly through the air like darts and pierce the skin of man and beast. An attractive colour note at this period was afforded by last year's stems of *Eriogonum inflatum*, the hollow stalks about 2 feet high, standing stiffly erect and of a glossy white texture like satin. *Covillea glutinosa* (Creosote bush) was in bloom, its strong odour filling the air. The ovary of these little golden flowers is covered with hairs, so that the older blooms have a silky tuft in the centre which develops into a round, densely hairy fruit, and gives a fluffy effect to the plant. Here and there was *Yucca baccata*, not yet in bloom, and the silver-white leafless stems of *Psoralea californica* (Ghost tree), having a wraith-like appearance at this time of year, with its bare thin white stems, which, later in the summer, will be profusely sprinkled with indigo-blue pea-shaped flowers that emit a balsam scent. Here and there a wild Apricot was beginning to clothe itself with tender green leaves, and *Chilopsis saligna* (Desert Willow), grey-stemmed, like so many desert plants, was just bursting into leaf.

From Palm Springs we made a trip to the 5000-foot summit of the Little San Bernardino Mountains, whence we were able to gaze across the Colorado Desert, stretching far and wide, surrounded by mountains, and in its midst the Salton Sea, 300 feet below sea-level and so alkaline that it looked as though the edges were covered with snow. It was a pretty hard trip, over 180 miles of rough winding trail in heavy sand, gravel and rocks, with abrupt turns that if you travelled at any pace were calculated to fling the car into a hole or against the grim stems of the Joshua trees, while on all sides rose great piles of rocks heaped one on top of the other in no decent geological formation, just flung up from the bowels of the earth in one of the many volcanic upheavals that brought these parts of California into being. The rocks of granite or sandstone were worn smooth by sand-blasting, and certainly are among the strangest things I have ever seen. Photographs, unfortunately, give but a poor idea of these colossal piles of unrelated stone standing forlornly out of the desert scrub. How these great boulders remain perched on one another with seemingly no foothold and at impossible angles is incomprehensible. We picnicked under one of these towering masses and found shelter from the keen wind that sweeps across the desert when it is not an inferno under the blinding sun. At the 5000-foot altitude grew *Juniperus californica*, a coarse-foliaged brittle Juniper, also a dwarfed Pine, called locally the Piñon Pine, and recent rains had brought a crop of *Erodium cicutarium* into growth, on which the cattle depend for sustenance; its local name, "Filaree," is a corruption of the Spanish Alfilerilla, from *alfiler*, a pin. Its long pointed seed-pods are an exaggerated edition of our

own Cranesbill. One wonders how any man can wrest a living from this grim desert, yet there are scattered shacks, surrounded with rough fences of barbed wire, and the arid land is so fiercely contested between owners that there have been cases of murder and fighting over that unpromising-looking ground, where a few miniature gold or silver mines owned by small speculators exist, but are not worth working. As you bump along you pass signposts with such names as "Lost Horse Mine," and others that I forget, and in a bare spot there was a simple wooden headstone marking the grave of an "Old Timer" named Lang, who, turning Christian scientist in his declining years, lived a solitary, roving existence in the desert until one day his body was found with the request that he be buried where he lay, with his feet towards the "Lost Horse Mine," on which heaven knows what hopes and dreams he had built in the eighty years of his life.

But there are other aspects of the desert, and more prosperous ones. Near Palm Springs lies the Coachella Valley, famed for its Date groves, which form oases in the grey sandy expanse and are surrounded by tall hedges of *Tamarix articulata*, giving protection from the fierceness of the sandstorms and the scorching heat of summer. The soil is pure sand, heavily irrigated: they use, as in the Citrus groves, a cover-crop of Mustard which is ploughed in green, and between the Date Palms are beginning to grow Grapefruit, having discovered that these trees thrive best in the broken sunlight through the high Palms which tower about them. Just below the foliage of the Palms swings a primitive platform of thin boards, used for men hand-fertilizing the trees, which is done by inserting a swab of cotton-wool with pollen from the male trees into the inflorescence of the female and leaving it for the wind to blow about. For propagation they use suckers only, though seed is plentiful enough and comes up like grass. The trees do not bear till they are between six and eight years old, but continue doing so up to 100 years, producing from 250 to 500 lb. of fruit apiece per annum—roughly speaking, fifteen bunches to a tree, all of which have to be carefully thinned to avoid bruising, so that Date growing is a highly specialized form of farming. The picking starts in September, and seemed, so far as I could make out, to go on incessantly! What more can a farmer demand of his crops?

After the welcome break of the Colorado Desert trip came a spell of Pasadena's pavements, but with the cheerful prospect of another journey with LESTER ROWNTREE, which started on March 12 in warm sunshine but with a lightly clouded sky that gave an opalescent effect to the atmosphere as we trundled towards the Bakersfield district, north-east of here and famed for its wild flower display. But I seem "hoodoo" to the ROWNTREE car, as I was three years ago, for we had not gone two miles before the hub-cap clattered off a hind wheel, but was quickly retrieved. Fifty miles farther we burst a tyre, and had to sit by the roadside—in a place where, of course, there was not a flower to be seen, only horrible brown ants, who thought we were provender sent for their benefit. Now, in

California, if you have trouble on the road, do not bank on the people who travel in opulent-looking cars with smart chauffeurs, because they will not help, but wait till you see some derelict conveyance or a lorry and hail it, for lorry-drivers out here are the "Knights of the Road," who will help if they can, or take a message to the nearest garage. Two such men came along, and in a comparatively short space of time we were off again after finding a 4-inch piece of metal embedded in the tyre and tube. That ended our mechanical troubles fortunately, and we followed the old ridge route through rolling country to Bouquet Canyon, deep cut in the mountains, and opening out on to Antelope Valley, where we began to get colour schemes in the shape of last season's *Eriogonum fasciculatum* stems, grey-pink against a background of Rose Madder-coloured Plum, Cherry and Apricot orchards here and there showing bloom, while grey Sage-brush clothed the hills, a study in emerald or indigo, and the higher mountains were stippled with snow. Here too were groups of *Lupinus Benthami* and *L. bicolor*, with a groundwork of *Coreopsis Biglowii*, *Gilia capitata*, *Eschscholzia*, and the nodding bells of *Streptanthera Coulteri* to give a note of brown; *Oenothera gracilifolia*, small, hairy-leaved golden; *Lupinus horizontalis* a little farther along with *Gilia Davyi*, loveliest of the family. We followed the Tehachapi Mountains and a spur of the San Bernardinos, all starred with neat mats of *Sanicula arctopodes* ('Foot-steps of Spring'), the soft yellow blooms of *Astragalus trichopodes*, *Oenothera scapoidea*, Hosackia and *Gilia Daringii* under the leafless branches of *Quercus Kelloggii*. But the best was yet to come, though Antelope Valley was lovely enough, and we descended the ridge route on to the Grapevine, so called from its tortuousness, and then there burst upon us a scene of such beauty that it gripped one with a choking sensation, for in the opalescence of the day, framed by a steep escarpment where the Grapevine opened out and dropped into the great valley below lay a vast amethystine sea of colour some twenty miles in breadth and ten in length between mountains aflame with yellow. To speak merely of yellow is a slack method of description, for endless shades went to form the beauty of those natural plantings, and one realized that no two flowers were of the same tone. Cream-cups were cream; *Monolopia major* the hue of old silver once gilded, but with the overlay now gently fading; *Baeria* and *Amsinckia* shades of old gold; *Eschscholzia*, the most baffling of all, seen near at hand a flaming orange, but at a distance on the mountain-sides a pillar-box scarlet, whilst *Layias* and *Malacothrix* were like scalded Cornish cream. The same diversity of colour applied to the blues and purples in those great splashes where mauve or purple *Brodiaeas* faded into blue, plum and amaranth Lupins that covered the Bakersfield Valley in an amethystine carpet over which the atmosphere brooded in a tenuous veil, blending the hues as an opal blends them and producing tones so elusive that no one could say here is green, here purple, here blue in that amazing stretch of glory over which the haze lingered as though loath to expose the flowers to the glaring

searchlight of the Californian sun. Once on the level among the flowers we saw that not only were there Lupins, but beneath them a veritable Persian carpet of smaller things, such as the small golden *Baeria*, *Oenothera bistorta*, *Gilia tricolor*, purple *Astragalus Coulteri*, and everywhere the papery whiteness of *Limnanthes dichotoma*, with its haunting fragrance of coco-nuts. As we followed down the road it was through a sweep of *Amsinckia*, and the rough stony ground was carpeted with big floppy white blooms of *Oenothera trichocalyx*, the fading blossoms suffused with pale rose and the scent almost overpoweringly strong. This planting merged in *Gilia tenuifolia* var. *Davyi*, *Layia glandulosa*, *Lupinus excubitus* var. *ostramonianus*, with silvery foliage, from which the tall stems of flowers stood erect; *L. horizontalis* in a soft shade of mauve, and beyond them a vivid sheet of *Orthocarpus purpurascens* that, in the westering sun, assumed a startlingly cerise tone. Never have I seen such colours or realized what Nature can do with her blendings and yet have nothing that clashes. Never either had I realized that there were such innumerable varieties of Lupins, for they run into many hundreds out here, and even so have not all been classified.

Wasco was our resting-place for two nights, being a good centre to work from, and work we did there two days, in a fairyland of flowers, travelling over dirt roads free from traffic, and the only living things were horned toads and scuttering grey lizards. One spot will always remain in my mind—a ten square mile tract of flat country, once cultivated, for there were still the banks which had enclosed irrigation ditches now an expanse of the flowers we had already seen, but with the addition of *Salvia carduacea*, with tall grey-furred stems and mauve blooms with protruding orange anthers; sheets of *Collinsia Davidsonii*, the blue-white colour of skimmed milk, and threaded among it all masses of *Nemophila insignis* in varying tones of sky-blue, and the flat-growing *N. angulata*, its big white blooms with a little purple nick in the edge of the petal and veinings of the same colour. We left that paradise, our boots all golden with pollen, while larks sang lustily, and blue-birds flashed by in a sapphire and turquoise gleam of beauty. From there we got into the car and bumped away over the open country towards the village of Woodey, where, alas! they were beginning to bore for oil, which means an end of the loveliness of those long series of softly rolling hills, rather like our Berkshire Downs, but with great washes of colour from *Phacelias* in variety and the smiling golden faces of *Viola pedunculata*.

(To be continued.)

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

***Achillea clypeolata*.** A.M. June 18, 1935. From the Director, Royal Botanic Gardens, Kew. A useful herbaceous plant of attractive colouring. The finely cut basal leaves are grey-green, the flower-heads bright yellow, arranged in flat clusters at the tips of erect growths 18 inches in height.

***Begonia* 'Lucy Dare.'** A.M. June 18, 1935. From Messrs. Blackmore & Langdon, Bath. A tuberous-rooted variety. Flowers 6 inches across, double, rich rose-pink.

***Begonia* 'Oriole.'** A.M. June 18, 1935. From Messrs. Blackmore & Langdon, Bath. A tuberous-rooted variety. Flowers 5½ inches across, double, apricot flushed with pink at the edges.

***Begonia* 'Violet Jackman.'** A.M. June 18, 1935. From Messrs. Blackmore & Langdon, Bath. A tuberous rooted variety. Flowers 6 inches across, double, bright salmon-pink, edges of the petals slightly waved.

***Eremurus* 'Citronella.'** A.M. June 25, 1935. From F. C. Stern, Esq., Goring-by-Sea. A recent addition to the series of hybrids of *Eremurus Bungei*, raised by the exhibitor. The present plant has large flowers of deep sulphur-yellow, closely set on the upper half of an erect green stem, 6 feet in height.

***Miltonia* × 'Petunia,' Eddington House var.** A.M. June 4, 1935. One of the best of the hybrids obtained by crossing *M.* × *Bleuana* and *M.* × 'Princess Mary.' The flowers are well formed and of rich ruby-crimson. Shown by T. Harrison Hughes, Esq., Eddington House, Hungerford, Berks.

Odontoglossum* × 'Mercurians' var. *perfectum (A.M. May 22, 1935) has been amended to *Odontoglossum* × 'Mercurians,' Prinsep's var., as the varietal name *perfectum* is already in use for a form of *O.* × 'Mercurians' which received an A.M. on May 20, 1931.

***Oncidium Jonesianum*, Eddington House var.** A.M. June 25, 1935. From T. Harrison Hughes, Esq. An epiphyte of pendulous habit with leathery terete foliage. The spike bore 5 flowers, somewhat larger than typical examples, the sepals and petals yellowish, much spotted with crimson-brown, the wide labellum white.

***Pæony* 'Kelway's Glorious.'** A.M. June 18, 1935. From Messrs. Kelway, Langport. A large double, creamy-white variety, slightly flushed with pink when first opening. The flowers are very sweetly scented.

***Philadelphus Delavayi*, Nymans var.** A.M. June 18, 1935. From Lt.-Col. L. C. R. Messel, O.B.E., Handcross. *Philadelphus Delavayi* was first introduced to cultivation in this country from Yunnan by the Abbé Delavay in 1890, and seed was collected later by Wilson and Forrest. It is a vigorous shrub with ovate, acuminate, toothed leaves hairy on both sides. The flowers are variable in size and texture. In the present seedling they are large and solid, strongly

scented, and arranged in a flattish spray. The petals are pure white, the calyx and pedicels plum-purple.

Rhododendron 'Aladdin.' A.M. June 25, 1935, as a hardy flowering plant for the woodland. From J. J. Crosfield, Esq., Embly Park, Romsey, Hants. A fine plant, with exceedingly beautiful flowers, the result of crossing *R. Griersonianum* × *R. auriculatum*. Raised by the exhibitor. Shoots stout, bristly-hairy. Leaves stalked; blades oblong, apex acute, base rounded, about 7 to 8 inches long, 2 inches wide, light matt green above, paler and thinly floccose-tomentose beneath, where the raised yellowish midrib is somewhat bristly; petioles stout, 1 to 1½ inch long, bristly like the shoots. Inflorescence a lax, loose truss of 13 to 14 flowers; rhachis reddish and densely short white glandular-hairy; pedicels about 2 inches long, reddish and densely long white glandular-hairy like the small calyx; corolla over 3 inches long and nearly 5 inches across at the mouth, the tube narrow cylindrical in the basal part, the upper part and limb funnel-shaped and the lobes eventually wide-spreading, the tube densely white glandular-hairy outside, bright vermilion but with a more orange hue inside, paling to a bright but soft rose-pink over the rest of the corolla with darker lines down the middle of the lobes to the base of the tube, light spotted at the back within; filaments reddish, sparsely glandular at the base; style much exceeding the stamens and as long as the corolla, reddish, densely white-glandular for three-quarters of its length.

Rhododendron × **'Albatross,' Exbury var.** F.C.C. June 4, 1935, as a hardy shrub. From Lionel de Rothschild, Esq., Exbury, Hants. *R. discolor* × *R. Loderi*. Raised by the exhibitor. Leaves up to 17.5 cm. long and 7 cm. wide, elliptic, rounded to cordate at the base, subacute at the apex, dark green above, glaucous below, borne on long purplish petioles. Flowers 10–13 in large, well-formed trusses which are about 22 cm. in diameter; pedicels purplish and pruinose, 4.5–5.5 cm. long; calyx reduced to a ciliate rim; corolla wide funnel-shaped, 7–8 cm. long, 12–13 cm. across, the lobes crisped and somewhat recurved, a delicate, slightly bluish pink colour when fully open, with brownish-red markings at the back of the tube within, deep pink in bud; stamens with glabrous, white filaments; style stout, greenish, white-glandular, much exceeding the stamens; ovary green, white-glandular.

Rhododendron × **'Cinnkeys.'** A.M. June 4, 1935, as a hardy flowering shrub. Shown by E. J. P. Magor, Esq., Lamellen, St. Tudy, Cornwall. *R. cinnabarinum* × *R. Keysii*. Raised by the exhibitor in 1917. A free-flowering shrub with light brown to dull grey branches. Leaves elliptic, obtuse at the apex, rounded at the base, 7–9 cm. long, 2.6–3.3 cm. wide, bright shining green above, rather mauvish glaucous and densely brown scaly below; petioles 1–1.5 cm. long, conspicuously brown scaly. Flowers about 8 in a truss, the terminal truss being usually supplemented by 1–3 lateral ones arising close to it, and with it forming a flat-topped head about 8–10 cm. across; pedicels about 1 cm. long, densely covered with pale green scales; corolla

narrow tubular with suberect lobes, 3.5-3.8 cm. long, waxy, slightly pruinose, a light clear red in the tube, the lobes soft yellow; stamens unequal, scarcely exerted from the corolla-tube, filaments rose-white, hairy in the lower third; style exceeding the stamens, white hairy at the base; ovary densely scaly.

Rhododendron xanthocodon. A.M. May 8, 1935, as a hardy flowering shrub. Shown by Lionel de Rothschild, Esq., Exbury, Hants (K.W. 6026). Branches stiffly erect, brown-lepidote, at first light green, later dark brown and finally greyish-brown. Leaves few, towards the ends of the branches, blades narrow ovate, obtuse, lepidote on both sides, dark green above, glaucous beneath, 4.5-6.5 cm. long and 2-2.8 cm. wide; petioles 1 cm. long, brown-lepidote. Flowers 6-10, laxly disposed at the apex of each shoot; pedicels 2-2.5 cm. long, pale green, slightly brownish above, densely and conspicuously lepidote; calyx completely lepidote; corolla tubular to funnel-shaped with the lobes erect, 3-3.5 cm. long and as much across, rather fleshy, yellow; stamens included, filaments white, white-hairy at the base; ovary quite covered with glaucous scales, style very pale green, as long as the corolla, upturned at the end.

Rose 'Conchita.' A.M. June 18, 1935. From Messrs. S. Low, Enfield. A bright salmon-pink Polyantha variety of free-flowering habit. It was raised by Mr. B. Jordan and it has already found favour as a market variety.

Staphylea Coulombieri grandiflora. A.M. May 21, 1935. From Lt.-Col. L. C. R. Messel, O.B.E. *Staphylea Coulombieri* received the Award of Merit on May 10, 1927, and is described in the JOURNAL, vol. 53, p. lv. The present variety is a vigorous shrub with light green, pinnate foliage and white flowers carried in pendulous panicles 9 inches long.

Vanda Parishii, Capstone var. A.M. June 25, 1935. Shown by A. M. Gentle, Esq., The Capstone, St. Albans, Herts. This closely resembles the well-known *Vanda Parishii* var. *Marriottiana*, of which a number of similar examples were sent to Europe shortly before the year 1880.

Vanda suavis alba. A.M. May 21, 1935. An albino form in which the white flowers are marked with light green. From Sir Jeremiah Colman, Bt., Gatton Park, Surrey.

Vuystekeara × 'Rosalie' var. 'Madge Le Gros.' F.C.C. May 21, 1935. A distinct hybrid in which the erect spike had four flowers, the sepals and petals reddish-brown margined with rose, the large labellum buff-yellow. (*Odontonia* × 'Duchess of York' × *Odontioda* × 'Laura.') Shown by N. Prinsep, Esq.

Warszewiczella (Zygopetalum) Wendlandii discolor. A.M. June 25, 1935. From Sir Jeremiah Colman, Bt., Gatton Park, Surrey. A showy species from Costa Rica. The comparatively large flower has light greenish sepals and petals, and a white labellum with a violet-blue centre.

GARDEN NOTES.

Vanda coerulescens.—Though *Vanda coerulescens* might be termed the diminutive of *V. coerulea*, beyond the fact that they are in the same genus the two species bear but little resemblance to one another. In *V. coerulescens* the flowers are barely an inch in diameter with almost spatulate sepals and petals, the latter slightly the narrower. Lavender is possibly the correct colour term for them, but variations occur as in all Orchids, and some forms are almost white. The petals have the usual *Vanda* twist, bringing the under surface to the front. The three-lobed lip has the front lobe projecting forward, almost parallel with the column. Nearly oblong in shape, it is denticulate on the front margin, and bears two thickened raised keels and several smaller, almost indeterminate, but all of a deep violet or violet-blue colour with lighter suffusions. The side lobes are inclined forward, their upper edges extending by the column sides, the prolonged foot of which with the lip base forms a short green-tipped spur. The slender pedicels and ovary are about an inch long, darker in colour than the sepals and petals. Ten to twenty flowers are borne on the ascending axillary scapes, usually in the summer. The leaf dimensions are approximately 6 inches in length by $\frac{3}{4}$ inch in breadth. Under cultivation 12 inches in height denotes a fairly large plant. A native of Upper Burma, it was first discovered by WILLIAM GRIFFITH in 1837. Since then it has from time to time been in cultivation, requiring, though so much smaller, the same treatment as *V. suavis*.

V. coerulescens seems to have no near affinity, though *V. parviflora* somewhat resembles it in habit, floral appearance and general characters.—E. Cooper.

Dendrobium bigibbum.—Though with smaller flowers than those of the popular *D. Phalaenopsis Schroederianum*, *D. bigibbum* is a worthy member of the same section. The flowers are about 2 inches in lateral diameter, less in vertical, almost round in outline, the petals, though broadly clawed, being nearly orbicular. The upper sepal is broadly lanceolate, and the lower sepals would be similar in shape but for the enlargement and coherence of the basal portions which so form a short spur with the prolonged column foot; the base of the lip is also formed into a short chin, which projects above the true spur, between the edges, and above the junction of the lower sepals. The name *bigibbum* is literally "two-humped," and probably refers to these gibbosities. The lip is not unlike a sugar scoop in shape, as the side lobes curve over the short column, while the front lobe is inclined outwards and slightly downwards. Colour throughout is rose-magenta, deepening to crimson on the lip and edges of the petals. A specific colour feature is present

in a pure white pubescent patch which terminates a narrow, strengthening plate running from the lip base to midway on the front lobe. The rounded outlines of the flowers, apart from the white speck, serve to separate the species from the typical *D. Phalaenopsis* and *D. Statterianum*, its nearest allies, and, like it, native to North Australia. The slender erect pseudo-bulbs seldom exceed 18 inches in height. Autumn is perhaps the flowering season, but racemes are produced from both old and new pseudo-bulbs. Three to five racemes may be developed, but not always at the same period. The species first appeared in cultivation in 1824. A stove temperature is essential to its culture, as it resents a winter temperature below 60° F. Small pans are preferable to pots, and as much sunlight should be given as safety allows. Even in summer only light shading should be given. In winter pipe heat necessitates occasional waterings.—*E. Cooper.*

Ebenus creticus.—This plant is a member of a small genus of about fourteen species which have their habitat chiefly from the Mediterranean to Asia Minor. They are mostly shrubby, only one species being mentioned as an herbaceous plant.

Although not a new plant, *E. creticus* is still somewhat rare in cultivation. A good figure is to be found in the Botanical Magazine, t. 1092, where it is named *Anthyllis cretica*, the drawing having been made from a plant cultivated in a garden at Brompton. GEORGE DON in General System of Gardening and Botany mentions this plant as being cultivated in 1737.

Ebenus creticus has by the earlier botanists been placed under several generic names, such as *Cytisus* and *Barbajovis*. As its name implies it is a native of Crete, where it is said to grow on rocks in exposed conditions. Its height is generally stated not to exceed 18 inches. The plant at Wisley is now about 3 feet 6 inches high and spreads to almost the same width, and may be seen in the half-hardy house at Wisley, where it grows out on a rocky ledge in a very sandy light soil and exposed to full sunshine.

Even in foliage it is attractive with its silky silvery foliage which is covered with adpressed hairs. In blossom it is conspicuous for pinky-red pea-like flowers borne in inflorescences about 3 inches in length. It continues to flower over a considerable period.—*R. L. Harrow.*

BOOK REVIEWS.

"Wild Flowers of the Great Dominions of the British Empire." By the Lady Rockley. 8vo. 360 pp. (Macmillan, London, 1935.) 16s. net.

This book, with too cumbersome a title, is, as its name implies, a substantial tome filled with erudition and the result of much work and investigation. The author has had the good fortune to travel widely and see for herself many of the flowers mentioned and illustrated in her book, and she has a good botanical knowledge, of which she has made full use. It is not a book to sit down and read, for it is a glorified guide-book that should be taken in smaller doses, and especially when the reader contemplates a trip to one or other of the Dominions named. Then it is invaluable, for it gives information, well set forth, and enables the traveller to watch for the flowers he is likely to see. I wish she had stressed the fact, in the Canadian portion, that the floras of the Rockies, the Selkirks and Coast Ranges are all different, which is one of the most interesting facts in Canadian botany. There are flowers which run the gamut more or less, but they are comparatively few, and Canadian botanists always speak of the vast differences between the three ranges of neighbouring mountains. Northern British Columbia is still largely unexplored floriculturally, and an expedition should go forth through the mountain territory of the North-West and bring its flora into general knowledge.

There is mention of *Tarax canadensis*, which the author says "is in Eastern Canada the counterpart of the European species." Here I must register a protest, for the Eastern Canadian Yew is always dwarf. Also in a sojourn of some years in Canada I have never found the least trace of fragrance in any of its beautiful Violets or Cypripediums. It was always a source of regret that such glorious flowers should be scentless. Another mistake is to say that *Cornus canadensis* likes "damp woods." It grows on the edges of woodland and likes a fair amount of sun, both in Canada and England. I never saw *Kalmia latifolia* in Canada, but I did in the States, though *K. angustifolia* stretches for miles over the Canadian "muskeg."

From Canada to Australia is a far cry, and it gives one to think when the author tells of the advance of *Opuntia vulgaris* till two million acres were besieged by this unpleasant plant, and it cost £29,345 in poisons to check its depredations. On the other hand, the glory of the tropical and subtropical plants of that vastly varying land makes one's mouth water, even though in one case the *Swainsonia Greyana* has the awful gift of affecting the brain of animals who feed on it, so that she cites an instance where horses, having eaten it, ran madly round till they fell exhausted and two out of nine died. Another drawback to Australia, in Queensland, is the depth the farmer has to bore for water. There are instances of going down from 1500 to 7000 feet for that indispensable necessity of life; but, elsewhere, we hear of a stream filled with blue Lotus and fringed with crimson Bottlebrush bushes, of great plants of *Hibiscus diversifolius* with amazing blooms, and many other floral glories make one long to be in such a paradise. The description of botanizing with the companionship of snakes, wild cattle and alligators lends a thrill to life such as I never experienced, for my flower-hunts in Canada were accompanied by nothing more devastating in the fauna than amiable brown bears gathering berries as autumn crept on near Dawson City.

In New Zealand again I came to a country that I have visited, and its "Englishness" is most striking, as Lady Rockley says. My visit was made in 1888, and things must have changed considerably since then, but its English characteristics no doubt remain. Well do I remember the beauty of the Ferns there; and also the irritating frequency of winds. In those days they used to say that one could always tell a man from Wellington, because in all weathers he held on to his hat from force of habit!

Tasmania I also remember and the marvellous Tree Ferns there. But it makes one sad to learn that there are no indigenous Roses in Australia or South Africa. However, there are many other flowers of a more gorgeous type to give joy—the Proteas of South Africa, for instance, and the Disas, Nerines, and marvellous Heaths, of which I am glad to see Lady Rockley has been able to utilize the admirable illustrations published by the Specialty Press of South Africa and to be bought at Kirstenbosch Gardens. Kenya, Rhodesia and Natal

are touched on less extensively than the rest of Africa, but here too we are given a good idea of the flora.

Of the illustrations I think almost the loveliest is the one of Western Australian Orchids by Mrs. Emily Pelloe, for the artist has skilfully given an amazing representation of flowers so frail and lovely that they are like butterflies suspended in mid-air.

I have one or two little bones to pick with Lady Rockley. Why did she place Tasmania in the middle of her Australian studies, thus jerking one away from Australia to a different atmosphere, only to take one back again to the far more tropical parts of Australia? Also why did she interrupt one's reading by the inclusion of so much and such futile poetry? Nothing, I think, is more irritating than to have one's eye and mind distracted when one is absorbed in a really interesting and instructive study of Dominion wild flowers.

"Flora of Moray: Flowering and Flowerless Plants." Edited by J. J. Burgess. 8vo. xv + 104 pp. (Courant and Courier, Elgin, 1935.) 5s.

This addition to local Floras will be welcomed. It gives a list of species of flowering plants and ferns found in Morayshire, with a note on the kind of soil on which they occur and localities for the rarer ones, and notes and partial lists of mosses, fungi, algae, etc., and upon the Coniferae, which form the greater part of the forests of the county. The last sixteen pages are occupied by indexes.

"Garden Making by Example." By G. C. Taylor. Ed. 2. 8vo. viii + 172 pp. (Country Life, London, 1935.) 6s.

The first edition of this book appeared in 1932 and the opportunity of revising the text, and to some extent adding to it, has been taken in preparing this second edition. The plans and illustrations, which form the chief feature of the book, are very helpful in suggestion to those about to make a new garden or re-plan an old one.

"Weeds." By Walter Conrad Muenscher. 8vo. 577 pp. (Macmillan, New York, 1935.) 25s.

Any publication which can serve as an ally in our struggle against weeds deserves a welcome on our shelves.

The early chapters deal with the dissemination and importance of weeds, and the subsequent chapters deal with the habitat of weeds of pastures, fields and gardens, together with some specialized habitats such as Rice fields and Cranberry bogs. The third chapter is concerned with the control of weeds, and here prevention receives adequate notice. An entire chapter is devoted to chemical methods of weed eradication, and some of the more recent work upon the thiocyanates is particularly mentioned. The older methods involving the use of chlorates and arsenical compounds are dealt with, but this portion of the book might well have been extended, for the entire work on sulphuric acid is dealt with in three paragraphs—somewhat scanty treatment.

The second part of the book deals with weeds arranged according to their family, and the list is a long one. Many of the plants are, of course, only too familiar in this country. The illustrations are excellent line drawings, showing both the habit and morphology of the plants. They should prove a great assistance in the identification of weeds. Naturally there are plants illustrated which do not trouble us in our own country fortunately, and occasionally we come across a plant which we treasure rather highly in our own gardens. An adequate glossary of botanical terms is provided, and the references to literature show that the author has rigorously selected his titles.

Finally there is a comprehensive index, a mixed list of plant names, chemicals, local names and treatments.

Useful as this book will prove as a reference by which weeds may be identified, and excellent as the line drawings are, it, however, has been priced too highly to enable all who desire to purchase it.

"A Flower Book for the Pocket." By Macgregor Skene. 8vo. 380 pp. (Oxford University Press, London, 1935.) 7s. 6d.

Professor Skene states in his preface that the production of this book has been possible through the generosity of the executors of the late Dr. G. Claridge Druce, who have placed at his disposal a large collection of paintings of British plants made by the late Miss Trower and left by her to Dr. Druce. We see, therefore, at the outset that this book has a personal link with one who spent a lifetime in the study of British plants, and it is fit that his work should be rendered more

popular, so that it may be appreciated by the many who still find pleasure and joy in our native flora.

Every effort should be made in our schools and by other educational means to draw the attention of the young to the need of preserving our flora, for in these modern days of easy transport the countryside is more frequently raided than ever before, so that many species tend to be exterminated. This little book should help to encourage the spirit of appreciation of the flora so that this depredation will become rarer. Only from a true knowledge of the plants can appreciation spring.

The book is designed for persons with little botanical knowledge. Its "keys," by which plants may be placed in their genus and family, are based on the old-fashioned definitions of herbs, shrubs and trees, and are very easily worked. To the professional botanist accustomed to the more elaborate keys, it may be a little unusual to find that he may place a plant in the same family by many different lines of approach. For example, it is possible to "arrive at" the Oleaceae on page 19 in four different ways. The descriptions of the species selected, and there are some 844 described, are couched in simple language and are free from botanical jargon.

The illustrations, numbering 529, are in colour. Generally they show the habit of the plant remarkably well, but the quality of the paper and the method of colour printing have a tendency to render the outline a trifle indistinct, especially when the book is held close to the eye or at ordinary reading distance. It would have been better if the small parts of the plant drawn, as, for example, that of the Water-starwort on page 189, had been in line drawings only. The artists' work differs slightly, so that the drawings by Miss Ruth Weston appear sharper than those from the late Dr. Claridge Druce's collection by Miss Trower.

The format of the book is such as we expect from the Clarendon Press: it is a true Pocket Book, although it requires a little more room than the well-known Hayward's Pocket Book.

We congratulate Professor Skene on this book, and thoroughly recommend it to those who desire a happy introduction to our plants, to those desiring to give a delightful present, be it birthday present or school prize, and to those "hikers," rambles, and all who appreciate our leafy lanes, fields and countryside.

"Apple Packing." Bull. No. 84. Min. of Agr. 8vo. 26 + 28 pp. (H.M. Stationery Office, 1934.) 1s. 3d., paper covers.

Competition with foreign countries has led to a careful study of the best methods of packing fruit for market, and this Bulletin is a result. It deals thoroughly with the whole matter, starting with Thinning the Orchard, the Tree, and the Fruit; Picking; Grading and Sizing and the equipment necessary; Wrapping and Packing, including the Packages and Labelling. Two appendices give particulars of the National Mark Grades for Apples, and of standard boxes and other containers for the marketing of Apples. Excellent illustrations show the different processes in a very clear fashion. The pamphlet is indispensable to those who grow fruit for marketing.

NOTES AND ABSTRACTS.

Echinacea and Allied Genera, Revision of [A critical study of certain epappose genera of the Heliantheae-Verbesininae of the natural family Compositae]. By Ward M. Sharp (*Ann. Missouri Bot. Gard.*, xxii, no. 1, pp. 51-152; 2 plates; 1935).—This paper deals with the comparative morphology, distribution and classification of the genera *Ratibida* (better known as *Lepachys* and sometimes included in *Rudbeckia*, with 5 species), *Jostephane* (2 species), *Echinacea* (5 species), *Zaluzania* (13 species), *Balsamorhiza* (14 species) and a new genus *Greenmaniella* (4 species), the group being confined (with the exception of *Zaluzania*) to North and Central America. Keys and detailed descriptions are provided.—W. T. S.

Finger and Toe Disease, Experiments on. By G. Potts (*Trans. Brit. Myc. Soc.*, vol. xix, Jan. 1935).—The author's attempts to infect with *Plasmodiophora Brassicae* plants outside the Cruciferae proved abortive. Soil acidity proved favourable, soil alkalinity unfavourable, to the development of the disease, and quicklime was found to inhibit the disease. Though the disease can occur in calcareous soils such soils are much less subject to the disease than those deficient in lime. Sulphates appear to encourage the disease. Spores of the disease were found to be capable of infecting plant roots to a depth of 12 inches.—F. J. C.

Fremontia, New Species of. By A. Eastwood (*Leaf. W. Bot. I*, 12, pp. 139-141; 1934).—The genus *Fremontia* is represented in our gardens by *F. californica* and *F. mexicana*, and these have long been considered its only members. In this paper three more species are proposed: *F. crassifolia*, distinguished by thick heavy leaves and a densely stellate-tomentose pubescence on its stems, petioles, lower leaf-surface and fruits and larger flowers than any other Californian *Fremontia*; *F. napensis*, with small flowers often rose-tinged and small rather thin leaves becoming almost smooth beneath when old; *F. odispoensis*, with small leaves often entire and white or rusty tomentose beneath. All are shrubs with attractive yellow flowers.—W. T. S.

North American Plants, New (Notes on Northwestern Flora, I). By Carl S. English (*Proc. Biol. Soc. Washington*, 47, pp. 189-192; 1934).—The author describes four new species of value as rock garden plants: *Claytonia nivalis*, from near the snow-line of Wenatchee Mts., Washington, with a fleshy tap-root, spatulate fleshy basal leaves and 3.5-6 cm. high stems bearing 3-7 clear rose-pink flowers 2 cm. broad; *Lewisia rupicola*, originally collected on bare, almost perpendicular cliffs in Oregon, and near to *L. columbiana*, with magenta-rose flowers; *Talinum okanaganense*, from Okanagan Co., Washington, with almost terete leaves and numerous satiny-white blossoms; *Gentiana saxicola*, a species found on rocky slopes and ledges in Lewis Co., Washington, at 4500 feet, with ovate leaves, stout erect 1.5-3 dm. high stems bearing 1-7 flowers, spreading sepals and deep violet-blue flowers with orbicular corolla lobes.—W. T. S.

Portulaca, Revision of (Versuch einer Monographie der Gattung Portulaca L). By Karl von Poellnitz (*Fedde, Rep. Sp. Nov.*, vol. xxxvii, pp. 240-320; 1934).—In this revision of the genus *Portulaca*, 104 species are recognized and described in Latin; a key in German is given for their determination. The primary divisions of the genus are based on characters shown by the capsules, seeds and involucral bracts. The genus has a world-wide distribution and includes many perennials, the well-known annuals *P. oleracea* and *P. grandiflora*.—W. T. S.

Sedum tuberiferum Stoj. & Stef. By N. Stojanoff and B. Stefanoff (*Notizbl. Bot. Gart. Mus. Berlin-Dahlem*, xi, pt. 110, pp. 1013-1023; figs. and map; 1934).—This new species from Mount Rila in western Bulgaria belongs to the *S. acre* group, and has little oblong-spathulate leaves, appressed to the stem, and starry sulphur-coloured flowers; it persists through winter by small underground oblong or globose tubers. The paper also contains notes (in German) on the synonymy and distribution in Bulgaria of *S. acre*, *S. repens* and *S. laconicum* (including *S. Sartorianum*, *S. ponticum* and *S. Stribrnyi*).—W. T. S.

Sempervivum subgenus Jovisbarba. By Karel Domin (*Bull. Internat. Acad. Sci. Bohême*, 1932, p. 10; 3 plates).—The genus *Sempervivum* has long been a source of difficulty to systematic botanists on account of the great variability of the species and the readiness (especially in gardens) with which they hybridize. This revision of the group with few- and erect-petalled yellow flowers (subgenus or section *Jovisbarba*) is primarily based on living material collected by the author in the Carpathians. He distinguishes ten species (*S. soboliferum*, *S. Allionii*, *S. hirtum*, *S. Hillebrandtii*, *S. Neureichii*, *S. arenarium*, *S. Simonkaianum*, *S. Heuffelii*, *S. Preissianum* and *S. tatrense*), providing synonymy and a key and descriptions in Latin. Proposed new species are: *S. Preissianum* Domin from the Pieniny Mountains of the Central Carpathians in Slovakia and elsewhere, with open rosettes 3–4 cm. across of ovate-lanceolate to lanceolate-oblong leaves, glabrous except at the margin, deep green and unspotted, 1.5–2.5 cm. long, 8 mm. broad, being broadest in the lower third, and 20–30 cm. high flowering stems with numerous, pale yellowish flowers, their petals being shortly fimbriate and 17–18 mm. long; *S. tatrense* Domin from the Tatra Mountains of the Carpathians is very close to *S. Preissianum* and may be an alpine form distinguished by its much smaller rosettes (rarely 3 cm. across, usually half that, with ovate-lanceolate leaves about 1 cm. long, 4 mm. broad) and shorter stems with closely crowded fewer-flowered inflorescences.

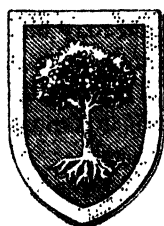
In Czechoslovakia the group *Eusempervivum*, having numerous stellately expanded petals, is represented by *S. montanum*, in numerous forms, and *S. Schlehannii* vars. *assimile* and *blandum*.

This paper was prepared (but not published) before the publication of Praeger's monograph and the two do not always coincide in treatment. '*S. hirtum* L.' sensu Praeger seems to correspond to *S. Preissianum* v. *hispidum* Domin.

W. T. S.

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GENTIANAS.

By C. T. MUSGRAVE, V.M.H.

[Read June 18, 1935; Mr. T. HAY, M.V.O., V.M.H., in the Chair.]

WITH the introduction of many new species in recent years Gentians have become extremely popular plants for the rock garden, and there can be few gardens in which *Gentiana acaulis* and one or more of the late summer and autumn flowering Gentians, such as *G. sino-ornata*, are not grown. Gardeners, and especially beginners, are, I think, rather apt to fight shy of Gentians because it is quite a common idea that they are difficult to grow. It is beyond question that some of the species are not easy, and a very few seem to defy all our efforts, but it is a great mistake to think that Gentians as a family cannot be grown except by the experienced gardener. If a little thought and care is given to making up the soil they require and providing them with sharp drainage—and no gardener worthy of the name will grudge that little trouble—many Gentians can be grown with comparative ease.

It would be useless, even if it were possible, to attempt to give any general directions for the cultivation of Gentians which will apply to every garden in all parts of the country. Most of us who live in the south and east are only too well aware that it frequently happens that there is not as much rain as we should like in spring, and that the summer is often very hot and dry. Now Gentians are plants of the high mountains, where the rainfall is usually heavy and the atmosphere damp and moist. Further, they always have an ample supply of underground water from the melting of the snows above them in

spring and summer. Gentians will probably therefore find the conditions of the climate in the west and north-west of this country, and particularly in Scotland, more suitable to their requirements than those of the south, and will consequently grow more easily in those districts.

Again it must be remembered that the quality of the three constituents forming the soil in which Gentians generally flourish—viz. loam, leaf mould and sand—varies very widely. The loam may be heavy or sandy; the leaf mould may be just decayed leaves or almost peat; the sand may be fine and apt to clog, or it may be coarse and very suitable for drainage. The best leaf mould is composed of oak leaves only, but oak and beech is almost as good. The leaves of the horse chestnut should not be used.

When, therefore, I give, as I propose to do, particulars of the soil in which I grow the different species of Gentians, I do not wish to convey the idea that the plants can only be grown in the mixture which I describe. I cannot go further than this—viz. that with the quality of loam, leaf mould and sand which I use I have been able to grow the plants successfully in a garden in Surrey.

It would be a thousand pities if the introduction in recent years of the many new species from Asia and elsewhere should lead to the older species from Europe being overlooked and forgotten. I venture to say that neither China, Tibet, the Himalaya or America has produced finer Gentians than *G. acaulis* in its many forms and *G. verna*. I will draw attention to a few only which are not often seen in gardens.

The first is *G. Froelichii*, a plant from the limestone ranges of the Eastern Alps. It is a dwarf plant only a few inches high, and has narrow grooved leaves and large upright flowers of a pale blue. This Gentian is not common, though it is quite easy to grow. The reason why it is not more common is, I think, that it takes a long time to get well rooted, and it is useless to put it out of its pot into the rock garden until that pot is full of roots. It grows quite satisfactorily in light loam and leaf mould.

G. brachyphylla is also seldom seen. It is one of the gems of the whole family, and comes from the very highest scree of the Alps, where it takes the place of *G. verna*. It has grey-green leaves and flowers of a brilliant light blue. In its own home the flowers sit tight on the leaves and are almost stemless, but when brought down to cultivation here the stems lengthen in the same manner as *G. verna*. Though coming from great altitudes, it is not so difficult to grow as one would expect, and it will succeed in a scree, and flower in July.

The last of the Europeans to which I will refer is *G. pyrenaica*, which, as its name implies, comes from the Pyrenees, generally at the eastern end. But it does not stop there, and appears again in the Carpathian mountains and is, I am informed, almost a common plant in some districts in Asia Minor. It is a very dwarf plant and has bright violet or purple flowers, and the corolla appears to have ten lobes. In fact it has five lobes only, but the folds between the lobes have developed

so strongly as to give the appearance of an additional set of lobes. This is not an easy Gentian to grow in the South of England. It is most likely to succeed in the scree with some peat and sand.

New Zealand has provided us with several Gentians, and the three following are well worth growing.

G. bellidifolia is an upright plant 3 to 9 inches high with small, narrow, pointed basal leaves, green edged with brown. The flowering stems are dark brown or almost black, and may have a few scattered leaves in pairs. The flowers are white, about $\frac{3}{4}$ inch across; they are terminal and are borne either singly or several together in a loose head. Flowers may also be produced on short stems rising from the axils of the leaves on the main flowering stems. This Gentian grows with me in a mixture of loam, leaf mould and sand and broken brick rubble in full sun. It is a high mountain plant and is quite hardy, but it dislikes overhead wet in winter and is then covered with a sheet of glass. The seed is round and almost black. The seeds of the majority of Gentians ripen slowly and there may be several weeks between the setting of the seed and its ripening. The seed of *G. bellidifolia*, however, ripens in a fortnight or three weeks, and may easily be lost unless it is watched.

I understand there is some doubt if this Gentian is correctly named. There is certainly some confusion in the names of the New Zealand Gentians, and I am told that the plant just described may be *G. patula*.

G. corymbifera is also an upright plant from 9 to 20 inches high. The basal leaves are olive-green in colour. The flowering stems are rarely branched. The flowers are white and are borne at the end of the stems in a closer, larger head than those of *G. bellidifolia*. The stems are frequently bare of all leaves, and at the most have a pair or two. It may be distinguished from *G. bellidifolia* by its longer basal leaves, its much taller and generally naked stems, and its closer and larger head of flowers. This Gentian is also a high mountain plant and is, I believe, generally found growing on the margin of a damp boggy place. It succeeds in my garden in a soil largely composed of leaf mould and broken brick rubble in full sun, and has as much water as it wants in summer.

This Gentian is not long-lived, and may die after it has flowered.

It has been suggested that this Gentian may be merely a local or geographical form of *G. bellidifolia*. I doubt this, as the two plants are so distinct.

G. saxosa is, generally speaking, a low, spreading plant, almost prostrate, and may always be recognized by the curious switchback habit of its stems. They grow outward and upwards for a few inches, then turn downwards, and finally again turn upwards at the tips. The flowers are white, and either solitary or several together in a loose head at the end of the stems.

This Gentian is a plant of the rocks and cliffs by the seashore of the Southern Island of New Zealand, and should be quite hardy here.

I grow this Gentian in the scree and in a stand frame, where it is planted in a light gritty soil with very sharp drainage, and where it is covered with glass in winter.

There are many Gentians from the American continent, and a few are worthy of mention.

G. Newberryi is one of the most distinct. It is a dwarf high mountain plant from North-Western America. It has single terminal erect funnel-shaped blue flowers on short stems. It is a very attractive high alpine and requires good drainage, and it will repay for having a sheet of glass over it in winter. It does best with me in a stony, gritty soil which is well drained, and in the scree. The true plant is a very fine Gentian, but many plants are, I am afraid, labelled *G. Newberryi* which have no resemblance to it.

G. Saponaria is a plant of the American woods, growing in dampish places. In its home it is, I believe, an upright plant 12 inches or more high. In my garden it is often inclined to flop. The flowers are very large, of a fine bright blue, and, as is the case with many of the American Gentians, the plicæ or folds between the lobes of the corolla are finely cut or frayed. This Gentian grows in rich loam and leaf mould, and should have at least partial shade.

G. Parryi comes from the mountains of North-Western America, and is a plant about 9 or more inches high. It is of the type of *G. septemfida*, but is erect, with glaucous, bluish-grey leaves. The flowers are deep dark blue in colour and are carried in a cluster at the end of the stems. It likes a good deep rich loam, and then it will flourish.

Several of the North American Gentians, such as *G. Andrewsii* and *G. Menziesii* (fig. 115), produce barrel-shaped flowers which never open widely or properly, and they are consequently not attractive garden plants.

It is too early, I think, to say much about Miss STAFFORD's Gentians from the Peruvian Andes. They have hardly settled down yet and shown their true form. In fact, I think I am right in saying that *G. campanuliformis* has not yet flowered. The dried specimens point to this being a really good plant if it will prove to be amenable in our gardens and the slugs will leave it alone.

G. peruviana, one of Miss STAFFORD's Gentians, is interesting and peculiar. Each of the petals has on its back a black line, and these black lines wrap up the bud so that it appears to be black. When, however, the flowers open, they are white both inside and outside, with the exception of the black lines which remain on the back of each petal. Unfortunately, it is either an annual or it dies after flowering. I suspect it to be an annual. There is a curious similarity between the flowers of this Gentian and those of the New Zealand Gentians.

It is from Asia that most of the newer Gentians have been introduced in recent years. Several of these have in the last twenty years entirely altered our ideas of a rock garden. In the old days the flowering season was practically over and gone by the end of July and

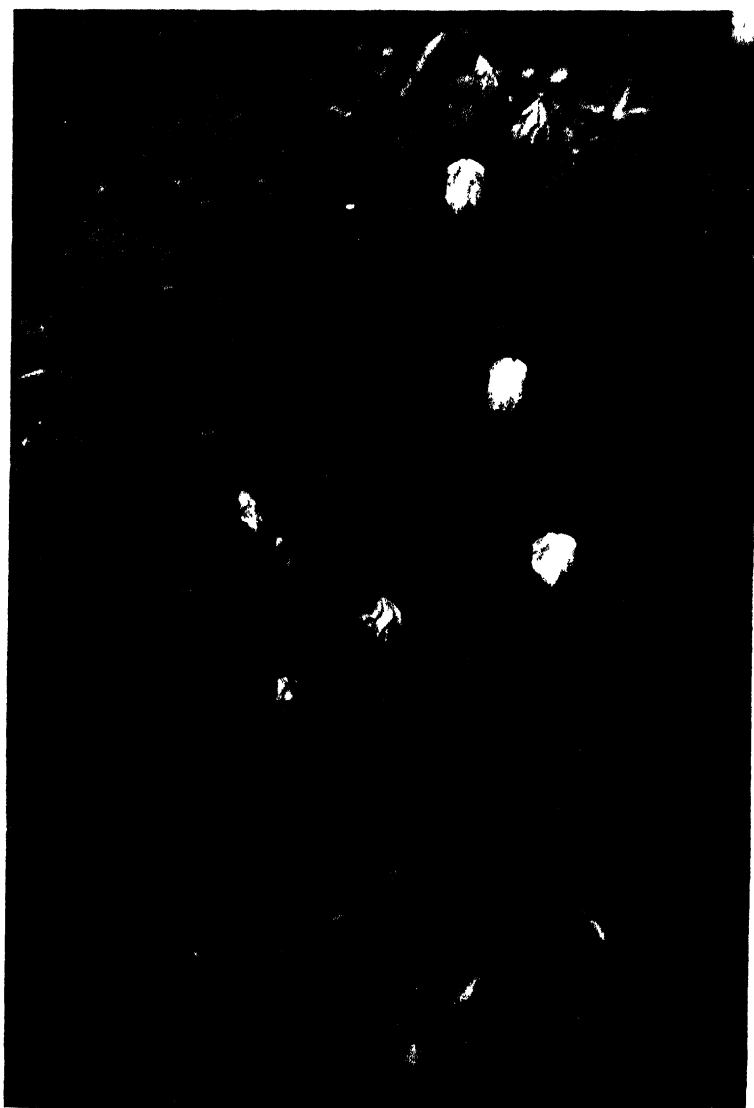


FIG. 115.—GENTIANA MENZIESII.

[To face p. 384



Fig. 116. —GENTIANA ORNATA

the rock garden was of little further interest for that year. At the present day some of these Asiatic Gentians provide a wealth of flower and beauty all through the late summer and autumn which it is not easy to equal at any time of year in the rock garden. It would seem that the number of these late-flowering Gentians is increasing with the later introductions from China, Tibet and the Himalaya—e.g. *G. Georgei* and *G. lhaguensis*.

A group of Gentians in the Frigida section is mainly responsible for this great change. The group includes such plants as *G. Farreri*, *G. sino-ornata*, *G. prolata*, *G. Veitchiorum*, *G. Lawrencei*, *G. ornata* (fig. 116), and may perhaps be said to include in a sub-group some very fine hybrids between these species.

All the plants I have mentioned are more or less prostrate, sending out flowering stems which have the very commendable habit of rooting as they lie on the ground and forming a new plant. They all carry a single flower at the end of their flowering stems, and in many cases these flowering stems branch and single flowers are produced at the end of the branches.

G. sino-ornata (fig. 117) is probably the best known of this group and does not require any description. But, in view of the long correspondence which took place in the Gardening Press on the subject of this Gentian during last winter, I might say this: *G. sino-ornata* has in the past been successfully grown in almost every part of the country and in almost every kind of soil except chalk and lime soils, and I cannot help thinking that with a return to normal summers, with normal temperatures, normal rainfall and a consequently moister atmosphere, it will again be as successfully grown as it has been in the past.

There is, however, a form of *G. sino-ornata* to which I would draw attention. The ordinary type form of this Gentian has one solitary terminal flower on each flowering stem, and the plant flowers in September and October and onwards until the frost comes. The form to which I would refer may have originated from Captain KINGDON WARD's seed No. 4859, and is, I think, a better form than the type. It comes into flower much earlier than the type form, and the flowering stems branch freely, carrying as many as six successive flowers. It will be realized that the flowering period is considerably prolonged. Last year the first flowers of this Gentian opened in my garden in the last few days of July and there were still flowers out in the second week in November. It was grown in the ordinary loam of my garden and was kept well supplied with water. So far as I am aware it has no varietal name.

G. Farreri (fig. 118) is not easy to grow in the South of England—that is to say, it is not often seen thriving with fresh green foliage, and it requires, perhaps more than any of the Gentians, an ample supply of water. Its flowers vary very widely; some are excellent and some hardly worth growing, and it is just as easy, or difficult, whichever word is used, to grow the best form as an indifferent one.

G. Farreri grows best in a light sandy loam with which is incorporated a good sprinkling of chips, and in the South of England should have, I think, partial shade. It is worth noting that seedlings raised from the best forms may produce plants with very poor flowers. It is therefore advisable to propagate good forms by means of cuttings. These should not be cut off the plant with a knife, but should be pulled off with a heel, when it will be found that they root readily in August.

The two plants which resulted from the crossing of *G. sino-ornata* with *G. Farreri*, viz. *G. × Macaulayi* and *G. × Macaulayi*, Wells's variety, are first-class garden plants and stand alone for colour, beauty and elegance.

They will grow almost anywhere—even in a soil impregnated with lime, so I am told.

They are both as easy to grow as *G. sino-ornata*, and easier than *G. Farreri*. They are both earlier in flower than *G. sino-ornata*, the flowers of which are often damaged by autumn rains.

They are both freer in flower than *G. Farreri*, at any rate in the South of England, and as free as *G. sino-ornata*.

They can be propagated with the greatest ease by division of the roots—as readily as those of *G. sino-ornata*.

The colour of their flowers is superb, and in my opinion much more beautiful than that of *G. sino-ornata*.

G. hexaphylla is another member of the *Frigida* section. This is a decumbent plant with no basal leaves but many flowering stems 4 to 6 inches or more in length, bearing tiny leaves in whorls. The flowers are large, funnel-shaped, blue spotted with green, and are borne singly at the end of the stems.

This is not so easy a Gentian to grow in the South of England, and it seems to prefer the cooler, damper air of the north. It grows with me in a peaty, sandy soil, and does not like full sun.

There is an interest attaching to this Gentian. It was when FARRER's collectors brought down to him seeds of *G. hexaphylla* that he noticed that some of the pods of seed appeared to be thicker and darker than those of the usual *hexaphylla*. He consequently separated them and sent them home under other numbers, the actual numbers being F. 315A and F. 473. These seeds turned out to be those of *G. Farreri*, and on so slender a thread did the introduction of this, one of the finest of all Gentians, depend.

G. hexa-Farreri, the result of the crossing of *G. hexaphylla* and *G. Farreri*, is a really good plant, more amenable to cultivation than either of its parents, but again doing better in a cool situation and in a cooler climate than in the south. It is of the same decumbent habit as its parents, and has blue terminal flowers.

G. ornata (fig. 116). The story of this Gentian has been well told by Mr. HAY in the *Gardeners' Chronicle* of October 13, 1930. He tells us that the name *G. ornata* has in the past been incorrectly given to plants from Nepal, China and Japan. Further, that two distinct species, both exhibited as *G. ornata*, have been given the R.H.S. Award of Merit,

one being in fact *G. sino-ornata* and the other *G. Veitchiorum*. This Gentian was found in the year 1820 by WALLICH in Nepal, but there is no evidence that living plants or even seeds ever found their way to this country until the year 1928, when, in Mr. HAY's words, "A large gathering of seeds was made in Nepal and sent home for the decoration of the Royal Parks and Gardens, and included the true *G. ornata*." The plant flowered for the first time in 1930, exactly 110 years after it had been found by WALLICH, and it is still an uncommon plant in English gardens. The flowering stems are thin, numerous and prostrate, up to 5 or 6 inches in length. The flowers are borne singly at the end of the stems, and in the older plants the stems have short side branches each carrying a single terminal flower. The lobes of the corolla are relatively large for the size of the flower and always reflex or recurve. This adds largely to the beauty of the flower. The colour of the flowers is variable—generally Cambridge blue to mid-blue.

The roots of *G. ornata* have been successfully divided in the spring, and each crown makes a good plant. This fact should ensure the plant becoming permanently established in gardens.

A mixture of loam and leaf mould suits this Gentian. It is an extremely attractive plant and flowers over a long period, into October and even November when the weather is open.

G. prolata is rather a curious plant. It has no central rosette of leaves, and when seen at its flowering time it will be noticed that it has a series of short leafy stems in the centre of the plant, also that it has several much longer flowering stems, the upper parts of which have fresh green leaves and a single terminal flower, with others on short branches below it. Further, it will be noticed that the leaves on the lower part of the long flowering stems have either entirely disappeared, leaving the stem bare, or, if they still remain, they look as if they were withered and brown. So, in fact, they are. What happens is this: The short central erect stems form the flowering stems for the following year, and the longer stems carrying flowers are really two years old, the leaves on the lower part having withered and dropped off in the second year of their life. At the end of the summer the stems which have flowered dry off and die back.

The flowers of *G. prolata* are variable in colour from light to medium blue, and in shape somewhat resemble a small edition of *G. Farreri*. Plants which carry the darker flowers are far the most desirable. The seeds are small, rough and brown. This Gentian is perhaps not such an easy plant to grow well as some of the others in this group. It succeeds in a light porous soil in which is incorporated a good deal of peat or leaf mould. In my garden it prefers partial shade or the protection of a rock or dwarf bush from the midday sun. There appear to be several forms or varieties of *G. prolata*, some of which may subsequently receive varietal names. Two of these have been recently introduced from Nepal. They are excellent plants and stand the sun in the South of England: in fact, they seem to enjoy it.

G. Lawrencei is another member of the *Frigida* section and is in some ways rather similar to *G. Farreri*, though on a smaller scale. The true plant is very rarely seen, though there are many hybrids in existence. It has very thin, narrow basal leaves and very slender flowering stems up to 5 or 6 inches long, clad with thin, narrow leaves which do not recurve or reflex. The flowers are a light sky-blue, and solitary at the end of the stems. The little stalk carrying the flower is invariably marked with a patch of purplish-red immediately above the last leaf. The open flower is considerably smaller than that of *G. Farreri*, and the lobes of the corolla are nearly always upright, not recurving.

In warm, sunny weather this *Gentian* opens its flowers freely, but with dull skies or cold winds the flowers remain closed. It seems to prefer a porous soil largely composed of a light loam, leaf mould and grit in full sun, with abundance of water during the growing season.

It is unlikely that there can ever be any confusion with either *G. Farreri* or *G. Lawrencei* on the one hand and such plants as *G. sino-ornata*, *G. ornata*, *G. Veitchiorum* or *G. prolata* on the other. But *G. Farreri* and *G. Lawrencei* are much alike and may be confused. It may be well, therefore, to point out the main characteristics of the two plants :

G. Farreri.

- (a) The leaves of the flowering stems, and especially the upper ones, recurve very distinctly.
- (b) The lobes of the corolla reflex or recurve.
- (c) The stem carrying the flower is marked with red just above the last leaf.
- (d) The throat of the flower is white.
- (e) The spread of the corolla is at least $1\frac{1}{4}$ inch and may be much more.

G. Lawrencei.

- (a) The upper leaves of the flowering stems are erect and do not recurve. Further, they are narrower than those of *G. Farreri*.
- (b) The lobes of the corolla are nearly always erect.
- (c) The stem carrying the flower is invariably marked with purplish-red just above the last leaf.
- (d) The throat of the flower is marked with blue and white lines.
- (e) The spread of the corolla is under one inch.

G. Veitchiorum is an almost prostrate plant which can always be immediately distinguished from the other *Gentians* in this group by its leaves and the habit of its growth. Unlike all those I have so far mentioned in the *Frigida* section, which are somewhat lax and spreading in habit, *G. Veitchiorum* is a stiffer, more compact plant with many flowering stems bearing green glossy substantial leaves. These flowering stems carry solitary terminal flowers which are practically



FIG. 117. GENTIANA SINO-ORNATA.

[To face p. 388.



FIG. 118.—*GENTIANA FARRERI*.



FIG. 119.—*GENTIANA VERNA ANGULOSA*



FIG. 120. --GENTIANA DINARICA

[To face p. 389.

sessile and have no stalk. In the best form these flowers are large, $1\frac{1}{2}$ to 2 inches long, of a good purplish-blue, the outside of the corolla tube being marked with five greenish-yellow bands.

G. Veitchiorum is not so free-growing a plant as some of the others in this section, nor do the flowering stems root from a node so freely as, for instance, *G. sino-ornata*. It wants a well-drained, light soil, and then is not difficult.

The crossing of *G. Veitchiorum* and *G. sino-ornata* has produced a very fine hybrid, far freer in flower and stronger than either of its parents, viz. *G. × stevenagensis* or the form of the same parentage called *G. × Wellsiana*. The hybrid has foliage intermediate between that of its two parents, and the flowers are carried on strong flowering stems which branch freely, each branch carrying a single terminal flower. The flowers are large, of a beautiful deep purple colour. There is no trouble in propagating this plant. Its roots are as easily divisible in spring as those of *G. sino-ornata*.

G. stragulata is an absolutely prostrate spreading plant with curious stems which look as if they were hard-wooded. These stems are thick, strong and branching, the branches interlacing and forming a mat. The flowers are long and tubular, carried at the end of the stems, generally in threes, one terminal and two just below it. The corolla tube is narrow and purplish-blue in colour, and the flowers are somewhat similar in shape and even in colour to those of *Cyananthus longiflorus*.

I cannot say that *G. stragulata* is a showy plant, but it always attracts attention. It grows well in a soil largely composed of leaf mould and grit, flowering in July and August. Cuttings strike easily when available.

G. trichotoma, once known as *G. Hopei*, is a tall erect plant up to 18 inches or 2 feet in height, forming many crowns. The basal leaves are 3 inches or more in length and are bright green, remaining fresh all through the winter. The flowers, which are always on short stems or stalks, are borne in a loose head at the end of the flowering stems and also on shorter stems rising from the axils of the leaves on the flowering stems.

The flowers are more or less tubular and about an inch long, the tube contracting towards the base and expanding at the upper end. Their colour is a dark shining blue outside and light blue shading to white inside. The pleats or fillets between the lobes of the corolla are a light sky-blue. As long as the flower is in bud the dark blue colour only is seen, but when it opens the two shades of blue make the plant an extremely beautiful and attractive one. To see this plant at its best it should be placed in a position open to the west so that the rays of the evening sun may fall on it. This Gentian thrives in a sandy leaf-mouldy soil, where it can get its roots down to moisture. Unfortunately it sometimes flowers so profusely that it cannot stand the strain and dies. The seed is light brown, rough and angular.

The flowering stems of *G. trichotoma* appear to start from a point

below the surface of the ground, and when they die down in autumn the main root of the plant is apt to rot off, especially in wet weather. It is advisable, therefore, to scratch away the surface soil for a depth of 3 inches or so round the root and replace it with fine chips or coarse sand to prevent water lying round the crown.

The same process may be advisable with other Gentians.

The Gentian which is so well known as *G. Purdomii* is a prostrate plant with long basal leaves and numerous long flowering stems up to 1 foot in length, bearing flowers of a good purplish-blue on short stems or stalks in a loose terminal head. A good plant may cover a space of 2 feet each way, and may carry fifty or more flowers out at the same time for several weeks. There are few Gentians which are more free in flowering than this, and it will grow in almost any good soil, light or heavy, and in any position, provided it can get its roots down to moisture. There is also a form with white flowers which is attractive. The seed is dark brown, smooth, round and like little hard pellets. It has been frequently pointed out that this Gentian is not *G. Purdomii*. The true *G. Purdomii* is an upright plant some 8 inches high, with six to eight flowers in a terminal inflorescence, and is probably not in cultivation in this country.

G. rigescens is from Yunnan in China. There are two very distinct Gentians bearing this name. The first is an upright plant some 10 to 20 inches high with thick reddish stems, and leaves which are broadly ovate. The flowers are large, something between funnel-shaped and tubular, and are borne in rather a close cluster round the end of the stems and also on short stems rising from the axils of the leaves. They are generally pinkish-blue, the pinker forms being the best. This plant, which I call the type form, is figured in the Botanical Magazine, t. 8974. The second is a dwarf, lax and almost decumbent plant; it has thinner stems and comparatively long narrow leaves, and smaller flowers which are a beautiful shade of light blue. This is a most desirable plant, and is so distinct from the type form that it appears to deserve a varietal name—if indeed it is not, as I believe, another species altogether, viz. *G. cephalantha*. Both the forms flower very late in the year, in late September, October or even November, and neither is difficult to grow. They do best with me in a good loamy soil in partial shade.

In a young state neither of these plants is really hardy. They may be cut or even killed by a late frost such as was experienced in May this year.

G. gilvostriata is one of Captain KINGDON WARD's later introductions. It is a prostrate plant with small silvery-grey leaves in clusters forming cushions 5 to 6 inches across. When not in flower this Gentian might easily be mistaken at a distance for an encrusted Saxifrage. The flowers are large for the size of the plant and are about 1 inch across, goblet-shaped, the colour being light blue shading to white in the centre. It grows well in a sunny position in well-drained soil which is not too heavy.

G. Kurroo is a plant which has been known for just 100 years. It was found by ROYLE in the year 1835, and is figured and described by him in his book on the Himalayan flora. Up to a few years ago it was still an uncommon plant in this country, but in 1929 a considerable quantity of seed was sent home from Kashmir and was generously distributed. An excellent note on this Gentian was contributed to the Gardeners' Chronicle by Mr. HAY and appeared in the issue of October 4, 1930. *G. Kurroo* has long narrow basal leaves, and the flowering stems are strong and may reach 1 foot or more in height. The flowers are terminal, large, light to medium blue, the outside of the corolla tube being frequently of a light green colour flushed with red.

REGINALD FARRER has told us in his English Rock Garden to grow this Gentian in a deep, rich and heavyish stony loam in the hottest and sunniest place in the garden, and in such a place the late Mr. HIATT BAKER used to grow it very successfully in his garden at Almondsbury, near Bristol. FARRER was generally right, though I have seen *G. Kurroo* growing and flowering well in light soil in sun, and in good loam on a north slope. I think a sunny place is advisable, as the plant flowers late in the season. In my garden it grows well in a good loamy soil. When once planted it should be left alone. Any attempt to move a plant other than a very young one is rarely successful.

G. Loderi is a plant from Kashmir. The flowers of this Gentian are very similar in shape and colour to those of *G. cachemirica*. Indeed it might be extremely difficult to distinguish between the flowers of the two plants in the absence of a portion of the flowering stem carrying some leaves. The two plants are, however, quite distinct in their habit of growth.

A full-grown plant of *G. Loderi* in flower forms an almost flat, circular plant 10 or 12 inches across, with a series of almost straight, thin, green flowering stems lying on the ground like the spokes of a wheel round the centre of the plant. The flowers are borne at the end of the stems, which turn upwards an inch or two as the buds appear. Young plants have one terminal flower only, while older plants may have three or more. The colour of the flowers is a silvery bright blue, and the outside ring of the circle formed by the plant is entirely composed of flowers. *G. Loderi* grows best in my garden in leaf mould, grit and loam, but it will flourish in any light, well-drained soil.

G. cachemirica is a plant which in its native country of Kashmir grows in crevices and cracks in the vertical face of wet rocks, the flowering stems hanging downwards. There are few rock gardens in this country which can provide such conditions, and here this Gentian forms rather an irregular, straggling plant, with numerous purplish-red stems which vary in length from 6 to 12 inches and which are curling, some upwards and some lying flat on the ground. The flowers are carried at the end of the flowering stems, generally singly, but there may be short branches near the end of the stems each carrying a terminal flower.

G. cachemirica presents no great difficulty in cultivation, and grows in a sunny position in the rock garden in any light soil which is well drained.

Among the seeds brought home by Captain KINGDON WARD from his last expedition there was included seed of a Gentian which we shall all value, if for no other reason than that it commemorates in its name one of the greatest of all collectors of our time, to whom we owe so many first-class plants, viz. GEORGE FORREST. This Gentian is named *G. Georgei* after him, and it is being grown by many of us now, but has not yet flowered. I believe it will prove to be a very fine dwarf plant, with large and very long purplish-blue flowers marked with greenish lines on the outside. It may flower this autumn, and when it does it will, no doubt, be seen in our Hall.

It is not easy to say which of all the Gentians are the best ; every gardener will have his own particular fancy. Of those which have yet flowered in this country, probably the following are the most distinct and give the best effect in the garden, and I give them in their order of flowering :

G. trichotoma.

G. Loderi.

G. sino-ornata, the early-flowering and branching form.

G. Farreri, the best form.

G. × Macaulayi or *Macaulayi* Wells's variety.

G. × stevenagensis or *× Wellsiana*, the hybrid between *G. sino-ornata* and *G. Veitchiorum*.

G. ornata.

G. Kurroo.

G. sino-ornata, the type form.

The easiest to grow are, I think :

G. sino-ornata.

G. × Macaulayi or *Macaulayi* Wells's variety.

The so-called *G. Purdomii*.

[The illustrations are from photographs taken in Mr. MILLARD's garden at Copthorne by Mr. D. F. MERRETT, except that of *Gentiana ornata*, taken by Mr. D. WILKIE in the Royal Botanic Garden, Edinburgh.]



FIG. 121. -- GENTIANA SEPTENTRIONALIS

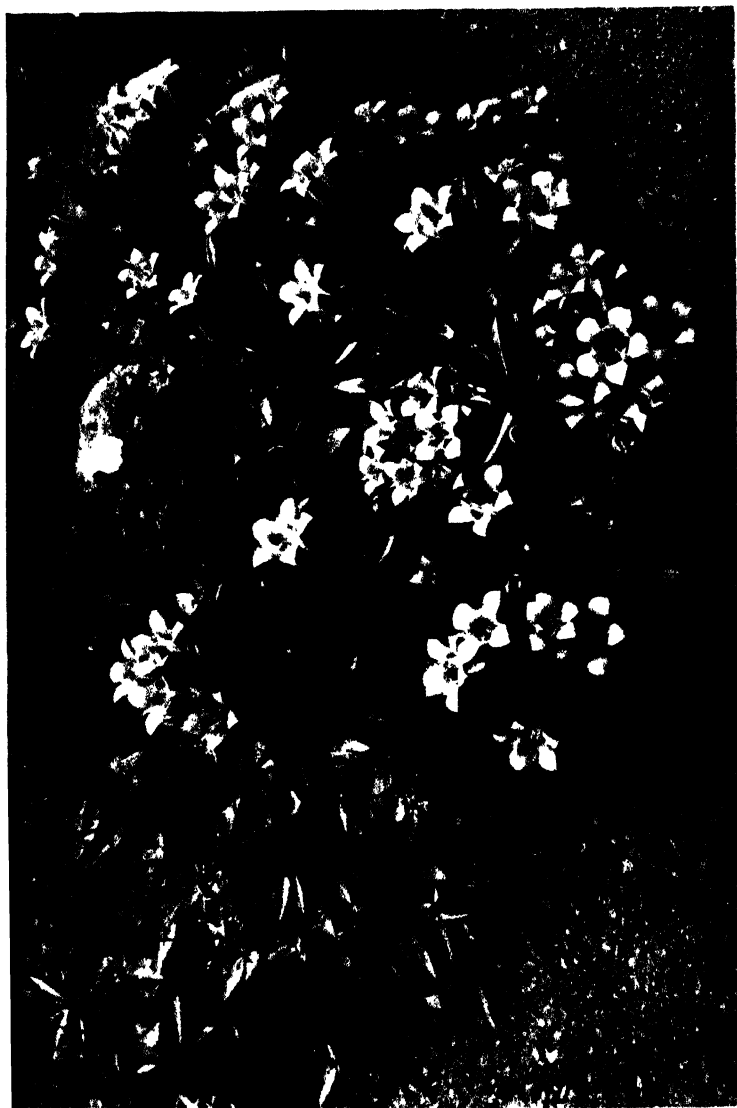


FIG. 122 -- GENTIANA LAGODICHIANA

CALIFORNIAN JOTTINGS.

By Viscountess BYNG OF VIMY.

(Continued from p. 370.)

AFTER Woodey, where flowers became scarce, owing to the higher altitude, we set our faces south-west towards White River, LESTER ROWNTREE swearing that she knew the way, though I was rather doubtful. We found a gate with the friendly notice: "Keep Out. Trespassers Will Be Prosecuted," but alongside it was a signpost, "White River." A tumbledown car filled with Indians came bumping towards us from the other side of the gate, and in reply to a question as to the curt "Keep Out," they said there was a road, though a rough one, to White River, and looked rather dubiously at us two women. It was a road by courtesy only. Floods had washed it, tearing down as floods can tear in this country, leaving boulders and ruts in its wake. But though the car grunted she lurched along gallantly, till in a great outcrop of rocks we were halted by the sight of strongly growing plants of *Mimulus floribundus* tucked into every crevice and in the full glory of golden, brown-spotted flowers and coarse foliage with tiny black dots. Here, too, we struck *Plagiobotrys fulvens* (Pop-corn flower), covering the meadows and hillsides as though with a powdering of fine snow. The narrow track was blocked with cattle that insisted on forming a cavalry escort, which was trying, for time was getting on; there is no twilight out here, and we were far from home on a totally unknown road, for by this time LESTER realized she was completely out of her bearings and had never been there before! However, on we bumped and slid till we did find White River, and then discovered that all the time the river she was seeking, so as to show me one of the Calochorti, was not White River at all but Posey Creek! It did not really matter, for we had seen some lovely country, and finally headed for Wasco, which we reached after dark, having started at 7 A.M.!

The next morning we left Wasco for Santa Maria, where my good friend, Mr. FRANK MCCOY, runs the Santa Maria Inn, famed throughout California for the wonderful arrangement of flowers in the dining-room. The drive from Wasco to Santa Maria was over some dull stretches of desert through Lost Hills, among masses of *Monolopia* and *Filaree* spreading itself in a rose-coloured carpet. The valley that led from Lost Hills to Cholame lay between dry treeless mountains, jade-green and bronze in colour, unbelievably covered with *Phacelia ciliata*, *P. distans*, *Brodiaeas* and *Eschscholzias*. From Cholame to Paso Robles came miles of orchards, Almond, Peach and Pear, with the grey-white of Walnut trees, giving an attractive note

to the landscape. Thence up into the hills once again, where the banks were covered with drifts of *Dodecatheon Clevelandii*, and the nodding bells of *Fritillaria biflora*, above a groundwork of *Viola pedunculata*. Bushes of *Salvia spathacea* (Humming-bird Sage), with its rich deep rose blooms, blended with the crimson of *Pedicularis densiflora* ('Indian Warrior') and the scarlet of *Castilleja parviflora* ('Indian Paint Brush') that bordered the dense Chaparral, and there were bushes of *Dendromecon rigidum* which were flowering freely, though the Ceanothus, alas, were over. We had plunged by then into byways beautiful beyond words. We struck canyons and mountains along such a track as I have not seen equalled anywhere, and it made the White River trip look like a highway, for this year's unusually heavy rains had practically eliminated whatever road there might have been through the densely shaded mountain-sides draped with *Adiantum pedatum*, under *Arbutus Menziesii* (Madrone), Manzanitas and *Quercus Kelloggii*, *Q. lobata* and *Q. Douglasii*. It was a beautiful but rather nerve-racking drive, for one could never see round the corners, and there were grades of such steepness that frequently one saw nothing ahead except the tip of the car's bonnet upthrust into space like a snub nose in a face, till I felt like the small child who on a road of this kind clung to her mother and wailed, "Oh, Mummy, why did God make the mountains so near the road?" Man has certainly done that with a vengeance in this country, especially with highways, for not only do the road-makers cut straight into the mountain-side, but there is no batter at all, and the sheer slope is one in one when it should, at least, be one in four to allow even a narrow margin of safety, with the result that under any weather disturbance the mountain-side comes rushing on to the roadway with immense rocks and tons of debris that not only ruin the road surface but bring disaster to the traveller. This scramble of ours over rocks and deep ruts was negotiated somehow without detriment to the car, and at Santa Maria LESTER said casually at the Automobile Association, pointing on the map to the road, "What is that like now?" and got the reply, "Oh, that's washed out and impassable." We grinned. It was not far wrong, only we had gone over it, that was all. It is curious how many spots in this country remind one of home. There were stretches like the rolling Norfolk country, others a vastly extended Salisbury Plain, and yet others like Boxhill, though *Ilex* took the place of Beech trees, and this imitation of England made me pretty homesick.

From Santa Maria we had a long dull 275-mile run over highways to Berkeley and the University of California, where we were housed at the Women's Faculty Club, and felt very humble among learned females! However, Dr. GOODSPEED, the Professor of Botany at the University, gave us a wonderful time next day round Berkeley, where there are many keen gardeners, though we only had time to visit Mr. SIDNEY MITCHELL's ground, where he specializes in Irises and Narcissi. Unfortunately, the Irises were not in bloom, but I have been forcibly struck throughout California by the fact that, whether

cared for or neglected, one never sees the faintest hint of Iris disease, the foliage is invariably healthy, plentiful, and, where there are blooms, they stand up on magnificently tall stems. Dr. GOODSPEED showed us the Botanical Garden of the University—now in the making—and the garden is his love and his despair. His love, because it should be so beautiful; his despair, because in these hard times money is scarce, and though he has a vast quantity of seeds collected in the Orient by Dr. ROCK, he lacks the funds to grow them on or to clear suitable places for their development, which is very hard, for I have never seen, except at Kirstenbosch, in South Africa, a more perfect site for a botanical garden. Here, as there, the ground is formed by a series of canyons running far back into the mountains above Berkeley, with astounding views over the harbour and the Golden Gate, and you can get any aspect you choose, any amount of shade or sun, and also any variation in soil that is required. Already there are fine beginnings in the shape of a small rock garden laid out by Mr. JOCK BRYDON from the Edinburgh Botanical Gardens; and Edinburgh may rest assured that this son of hers has benefited to the full from his training, for he has created an exemplary bit of rock work as it should be—and so rarely is seen out here! Himalayan and Chinese Rhododendrons flourish at Berkeley, native trees and shrubs have been judiciously thinned and left in sheltering groups, for above San Francisco shelter is needed from cold as well as heat, and if any money is available and the government can become interested in Dr. GOODSPEED's dream, I am fully convinced that in a few years time he will have a botanical garden second to none in beauty and interest.

We left the "seat of learning" early next morning, setting our faces toward Ukiah, where we had planned to meet Mr. CARL PURDY, but on the way saw a signpost, "To the Petrified Forest," and my itching curiosity made us turn aside. Well worth while it was, for the great petrified Sequoias are magnificent, and according to history, six million years ago, during the volcanic eruptions of Mount St. Helena, the lava flowing down uprooted and buried the forest of giant Redwood, and by the infiltration of silica turned them into stone, which preserved their exact form. The "Queen of the Forest" is 80 feet long and 12 feet in its mean diameter, and the "Monarch," 126 feet in length by 8 feet in diameter. There they lie amid many great blocks of petrified wood, exactly like their living brethren, and one cannot believe they are no longer alive till one touches the ice-cold surface of these dead giants lying full length in a lovely grove of Madrones, Manzanitas and other native shrubs and trees. After this side trip we continued on our way along highly respectable and therefore rather dull roads towards Middletown, and struck a totally different land, for the Napa Valley is given up entirely to vineyards, and the place so Italianized that even the Eucalyptus have been trimmed till they give an effect of Cypresses! Here, instead of wooden shacks, were big brown-stone buildings, "Wineries," with such Italian names as Salmonica, Pocai, Angelli, Moschetti and Ferrara on the tin letter-boxes at the roadside.

The cultivation was perfect, and therefore not a wild flower to be seen, but, as LESTER said with a sigh of satisfaction, those solid brown-stone buildings gave a sense of permanence which is often lacking in this country.

We reached Middletown about sunset and heard of an hotel at Harbin Hot Springs, some fifteen miles up a deep canyon, and we eventually found a sprawling wooden building tucked away in the loveliest wooded mountains with hot sulphur springs. We were the only people there, except the owners, a middle-aged and simple couple, who had homesteaded there five-and-twenty years ago and gradually built up this primitive hotel in an adorable country, where there was not a sound and the full moon came sailing up into a cloudless sky over the tree-tops. There were flowers galore coming up in this lovely wooded canyon, but we were too far north to see them, and the late spring had retarded them. The next morning we headed for Ukiah, crossing Mount St. Helena, where R. L. STEVENSON sojourned and wrote "The Silverado Squatters," and nearby JACK LONDON lived, died and wrote "The Valley of the Moon." But that day's travelling was bad, for we ran into a snowstorm on the mountain-top; it was horribly cold, the windscreen wiper would not work, and the road was skiddy, so we were both rather glum and not at all sorry to drop down into Ukiah late that afternoon in a torrential downpour of rain. That was all very well for made roads, but the PURDY home was up in the mountains, and the next morning when we woke it was to find snow on all the high ground, and the question was, should we be able to get there? Mr. ELMER PURDY, however, rang up the hotel and said he would fetch us in his car, a venerable Ford with a high clearance. And how thankful I was that he took us up, for the road is just a nick out of the mountain-side and very greasy, so that only an expert driver, who knew it well, could have made the trip safely. Mr. PURDY did this admirably, but I confess my heart had a most unpleasant trick of getting into my mouth and tasting badly. In an ordinary way the road was quite all right, but it was not an "all-right day," with melting snow an inch deep. It was a bitter disappointment, for we had come many miles north for the pleasure of meeting Mr. PURDY and seeing his flowers in bloom, and instead of browsing happily in the hills and valleys, where he has millions of treasures, we could only plough around in an inch of snow and see the poor *Erythroniums* and their friends almost buried beneath it. But what a place to grow bulbs! Mr. PURDY has acres upon acres of virgin forest that he has judiciously cleared and thinned to give him ideal conditions, and he has the rarest thing of all in California, a natural water supply, that comes trickling and tinkling down the hillside to be piped to the different levels where Lilies and other bulbs are grown, whilst another gift of Providence is soil—such soil too, for Mr. PURDY told me he could drive a 6-foot rake handle into the ground and still find the most perfect soil in the world. Some people are lucky! So here lives this veteran collector and grower, leading the life he loves and would change for no other, in

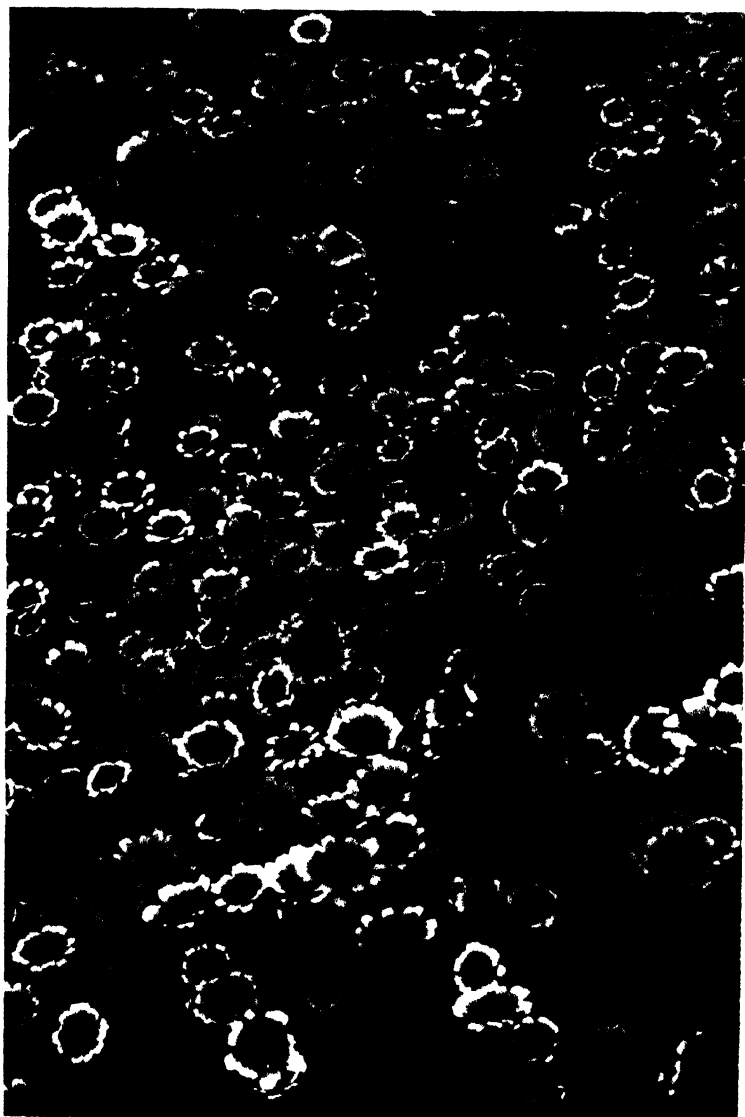


FIG. 123.—*LAYIA PLATYGLOSSA* IN CALIFORNIA.

To face p 396.

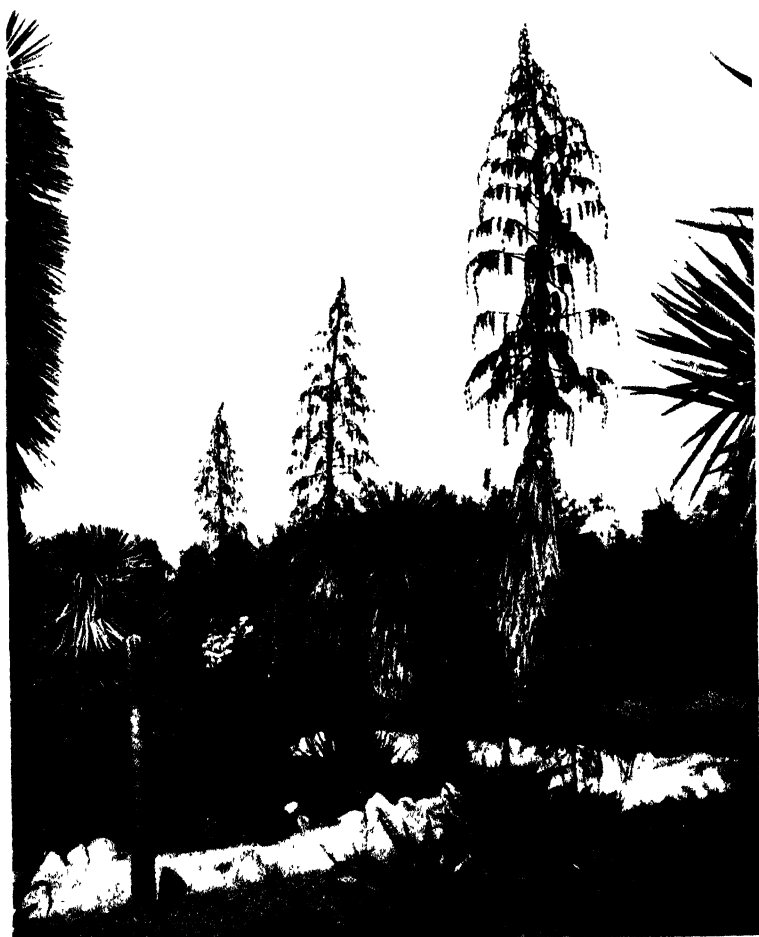


FIG. 124. -*FURCRAEA ROEZII* IN CALIFORNIA.

a little wooden house clinging to the mountain-side, and looking down the deep canyon over his growing grounds where, north, south, east and west, they lie. From 1888 to 1902 he collected all over the country and still at seventy-four years of age goes camping and collecting. He greeted us with the greatest friendliness, and we sat and talked in the living-room till the snow had melted a little, and he told us that he could still plant a bed of *Calochortus* bulbs at the rate of six a minute for ten hours, which speaks volumes for his energy and the Californian climate. In spite of the weather it was a delightful experience that day in the hills at the PURDY home where, at lunch, Mrs. PURDY shed a beaming welcome upon us and Mr. PURDY talked of his experiences in a long life of collecting and growing the Californian bulbs for which he is famed. Despite the snow we paddled up and down the beds and saw, where we could, the bowed heads of innumerable *Erythroniums* and enjoyed the beauty of that snow-powdered landscape before we started on our downward trip to pick up the car at Ukiah and set forth for Petaluma, since it was evident that to go farther north was hopeless in the existing weather conditions. So south we turned, regretful at missing the Redwood trees up north, though as we drove along the highway past the Big Basin, near San Francisco, we saw some of the smaller trees, which was better than nothing. But, alas, the flower days were practically over, and Carmel was the only place where we should see them again. From San Francisco we ran through another section entirely given over to vines and orchards, and the only event of interest was when, having struck the main highway from a byroad, we were confronted by an unending stream of motors, all going our way. After waiting for a break in it we finally cut across the road and joined it to find every car packed with Mexicans, who glowered at us savagely and kept on trying to pass us, and it was not till we had travelled about a mile and missed our proper turning that we discovered we were in the middle of an enormous Mexican funeral, which must have been at least two to three miles in length! No wonder they glowered at us. The second episode that same day was when we reached a little town called Watsonville and hit off the whole of Tom Mix's Circus—clowns, jugglers, elephants, ponies, etc.—and owing to the narrow road, packed with onlookers, found ourselves forced to follow along with the procession, headed by a loud band in an open scarlet car. What part the crowd thought we occupied in the circus heaven knows, but anyhow we had a good laugh over it and finally left the circus, where it had located itself between two cemeteries alongside the road!

Arrived safely at Carmel I put up again at Peter Pan Lodge, perched, like Barrie's famous house, in the tree-tops among the pines. We wandered round the Seventeen Mile Drive, a marvellous piece of coastal scenery, though now marred by too many recently erected houses. It struck me as a tall order that you should be charged 50 cents to enter the drive and then find that the best pieces of shore having been sold it was impossible, in many cases, even to get sight of the ocean, owing

to barbed-wire enclosures and "Keep Out" notices. Certainly the realtors of Carmel are adept at making money both ways! However, we were still able to look at Seal and Bird Rocks, the latter black with cormorants, and in the shallow water a party of sea lions were courting, a most amusing sight. On the high bluffs of Carmel Highlands there were flowers again in plenty, for the ground was carpeted with dwarf Mallows, *Mesembryanthemums*, *Abronias*, *Sisyrinchiums*, shading from pale blue to a purple that was almost plum-coloured, and the spikes of *Zygadenus Fremontii* just passing out of flower, while *Iris Douglasii* and *Rosa gymnocarpa* were blooming under the red-stemmed Fir trees. On a bluff that stands foursquare to the heavy gales which sweep over Carmel the Chaparral grows close and dense, and among it are dwarfed bushes of *Adenostemma*, of *Ceanothus thyrsiflorus* and *C. rigidus*, the former a mass of vividly blue flowers. The ground was thick with low-growing plants, while the Pacific roared against the rocks as I bade LESTER ROWNTREE farewell at her little wooden house perched high above the surrounding country and tucked into a deeply cut canyon. Her own small garden was a blaze of colour, though in her absence it had felt the want of her care, and will again, for she will not be there long now because she counts on "packing" into the high sierras, with a donkey to carry her belongings. What a miscellaneous load that unfortunate animal will be asked to carry, and what a funny little pair they will be as LESTER goes trudging on her way singing, as she always does when happy, up the mountains, alone with her donkey and the sierra flowers! I wonder what her beast of burden will think of it all? I wonder, too, how often the "pack" will be under the ass's belly rather than on its back, owing to her somewhat primitive notions of packing! And still more do I wonder what lovely things she will find and bring back for us less adventurous gardeners.

ROSE SEEDS: THEIR AFTER-RIPENING AND GERMINATION.

By Dr. M. A. H. TINCKER, M.A., Wisley.

Introduction.—The wide distribution of the genus *Rosa* and of many of its constituent species is probably a resultant phenomenon closely related to the great age of its members in accordance with the hypothesis postulated by WILLIS (11).^{*} The species generally range over the north temperate zones, particularly of Europe and Asia; some species are circumpolar as *R. acicularis* Lindl., others are more confined to high latitudes as *R. villosa* L., whilst many have a very wide distribution. *R. canina* L., for instance, ranges throughout Europe, North Africa and Western Asia, and a very closely related, if not identical, group of plants occurs in North Mexico. *R. arvensis* Huds. is found throughout Central and Southern Europe; another indigenous species, *R. spinosissima* L., is found in Northern Europe and North Africa and extends to Northern Asia, almost to the Himalayas. Yet other species extend southwards towards the equator, a number of them being confined to the cooler higher altitudes.

It is hardly necessary to mention that the existence of many intermediate and connecting links between the more widely differing naturally occurring plants has always made classification of roses difficult; multitudinous minor differences have long been the joy of the collecting naturalist and the bane of the systematists. HOOKER and BENTHAM (8), in 1884, were prepared to recognize some thirty species, but many thousands of names and descriptions have been allocated by such wild enthusiasts as GANDOGER. Into this welter of nomenclature some order has gradually been restored. The only classification that will stand the test of time is one based on genetical and cytological evidence as well as on morphological differences. HURST (9) has examined the chromosome content of many species. He found differential polyploidy to occur in the genus, and he groups the species closely related to one another morphologically upon a cytological and morphological basis.

As well as the large number of varieties and species encountered in Nature a large number of similar plants can be observed—there is a large natural population. This is an indication of successful methods of reproduction by vegetative means and/or by seeds. Evidence of the vigour of vegetative growth and also of the production of new plants by means of suckers or runners from underground shoots is readily obtainable for numerous species both in the field and under cultivation. On the other hand, self-sown seedlings are not very

^{*} Figures in brackets refer to the list of references given at the end.

frequently observed in the field or garden : a state of affairs partially, but only partially, explicable by the separation of the seedlings in space as a result of the dispersal of the achenes. It appears that spontaneous and rapid germination is not frequently observed either under natural or semi-natural conditions. This is an old observation, for Theophrastus remarked upon the practice of the people of Philippi who preferred to propagate their native roses collected on Mount Pangaeus from cuttings rather than by seeds, because germination was slow.

It is unnecessary for us to attempt to trace out in any detail the historical aspects of this subject ; suffice it to observe that the peculiarities of Rosaceous seeds in regard to their slow germination have frequently been remarked upon in the subsequent centuries. Gradually a technique for dealing with such " seeds " has been evolved by the practical growers. Detailed instructions are found in the early fruit manuals concerning the sowing of apple and pear seeds—the practice of covering the entire rotting fruit in the soil receives favourable commendation by several authors. Details are also given in the handbooks and dictionaries of gardening, which the writers claim will, if followed, accelerate the germination of other Rosaceous seeds. The methods in general favour amounted to the storage at low temperatures in moist sandy soil of the achenes for a long period either in a " rot heap," where the whole fruit was placed, or in a soil " seed cone " using the achenes only, or in pots where seeds were placed in strata with sand. Under these conditions of fluctuating moisture, temperature and aeration, maturation processes, resulting in early germination, took place. Other observations made by early horticulturists deal with various methods of soaking or steeping the achenes, but general agreement on the results obtained does not seem to have been satisfactorily established. The small size of the achenes of many Roses has precluded ready mechanical abrasion of their hard fruit walls.

The investigation of problems of dormancy and germination along physiological lines is of comparatively recent origin. Many Rosaceous seeds, though possessing an apparently mature and well-formed embryo, will not germinate at once but require a period of " after-ripening " ; this period of delay cannot be entirely overcome by mere mechanical rupture of the seed coverings, the importance of which in holding up the process of germination has been pointed out by CROCKER (2). The geographical distribution of species of roses (as of other genera of Rosaceae) ensures that in Nature seeds formed in autumn must pass varying periods under environmental conditions which include freezing, thawing, and low temperature fluctuations with variations in the moisture content of the media in which they lie. It is therefore not surprising that investigations of the influence of these factors upon the processes involved have been undertaken. For example, DAVIS and ROSE (4) showed that hawthorn seeds if removed from the carpel and held at 5° C. or 6° C. under moist conditions will germinate

after 2½ to 3 months, if the testa be also removed after one month. ECKERSON (5), more particularly concerned with the chemical aspects of the changes taking place during the period of after-ripening, found that germination could be accelerated by treating the embryos with dilute acids, so confirming earlier observations accredited to HUMBOLDT and others. HARRINGTON and HITE (7), working with apple seeds, found that storage under cool moist conditions accelerated germination. CROCKER and BARTON (3) found that moist peat, having a reaction of p_H 4, maintained at 1° C. to 5° C. for 3 to 5 months proved a satisfactory storage medium in which to treat apple seeds to shorten their period of dormancy. The seeds also after-ripened in fruits kept in cold storage. With the peach slightly higher temperatures proved satisfactory; they tested nine species of *Rosa* and found a constant temperature of 5° C. effective in aiding germination.

The experiments to be described were undertaken, firstly, to ascertain how far the older methods of treatment were reliable; secondly, to attempt to hasten the germination of rose and other seeds by modern methods of storage. Particular attention was directed to those methods of treatment likely to prove practicable under trade conditions and in gardens. The use of a small cooling apparatus, such as a domestic refrigerator, renders freezing and cooling and cold storage more widely available.

THE COLLECTION OF EXPERIMENTAL MATERIAL.

Many of the plants from which the fruits were collected for the experiments grew in the large collection of species and varieties planted on a sandy bank running parallel to the River Wey in the Wisley Gardens. They were mature plants, some being ten years old, all at least four years. Other fruits were obtained from roses planted elsewhere in the grounds for hedges and other purposes, and lastly collections of fruit were made from mature plants found in the vicinity on the commons and in the hedgerows. The various species did not all yield fruits in equal profusion each year, so that in certain seasons it was not possible to obtain a large enough sample of the fruits of some species. Difficulties of nomenclature and identification occurred.

After their collection the fruits were spread out to dry for a few days in the laboratory; they were then opened and their contents removed. The achenes were cleaned from adherent hairs and coloured pieces of the fruit as far as possible. In the fruits the puparia of *Spilographa alternata*, identified by the Entomologist, were occasionally found—generally the achenes themselves appeared well formed and sound.

The formation of seeds inside the achenes was observed. By cutting open a representative sample of the achenes the percentage of "heavy" achenes possessing well-formed seeds was determined. In practice it was found to be rather easier to ascertain the presence of the embryo in achenes kept in dry conditions for a year or so than

in freshly gathered samples. On examination after cutting the woody pericarp a high percentage of well-formed seeds was found in nearly all samples, as the data in Table I show.

TABLE I.

Chromosome complement (Hurst).	Rose species or variety.	Season fruit developed.	% Achenes with well-formed seed.
Diploid	<i>gymnocarpa</i>	1934	65
	<i>Helenae</i>	1934	80
	<i>Ernestii</i>	1934	80
	<i>rugosa</i>	1930, 1934	100, 100
hybrid	<i>x calocarpa</i> (<i>rugosa x chinensis</i>)	1932, 1934	95, 100
Tetraploid	<i>pendulina</i>	1934	95
	<i>mollis</i>	1931, 1934	95, 100
	<i>multibracteata</i>	1932, 1934	95, 95
	<i>gallica</i>	1934	95
	<i>pomifera</i>	1932, 1934	95, 95
	<i>spinosissima</i>	1931, 1933	100, 100
	<i>virginiana</i>	1932, 1933	95, 95
		1934	100
Pentaploid	<i>canina</i> var.	1932, 1934	90, 95
	<i>canina</i> var. <i>dumalis</i>	1931, 1932	90, 90
	<i>canina</i> var. <i>Andersonii</i>	1934	75
	<i>rubiginosa</i>	1931, 1934	95, 100
	<i>rubiginosa</i> var.	1934	100
? hybrid	<i>x Chabertii</i> (<i>canina x gallica</i>)	1932, 1934	80, 100
Hexaploid	<i>Jundzillii</i>	1932, 1934	100, 85
	<i>Moyesii</i>	1933, 1934	100, 100
	<i>nuthana</i>	1930, 1934	95, 100
Not known to M. A. H. T.	<i>baicalensis</i>	1932, 1934	85, 90
	<i>pineliensis</i>	1934	100

Seedlings.—In this paper the success of the germination of a sample of achenes was judged by the number of seedlings established; such seedlings could be well expected to grow into mature plants given reasonable facilities of space. The percentage of seeds that germinated would be higher, as some poor weak seedlings may not have attained the stage of growth at which they would be visible above the soil; for this reason the figures, often lower than usual, are free from the unreliability that weak seedlings or irregular germination may cause.

Cross pollination and fertilization may have occurred, as no precautionary measures were taken to prevent this, and hybridization of roses is known to take place in Nature. The seedlings do not necessarily resemble in genetical constitution the parent plant from which the achenes were gathered. The data presented in this paper refer to the parent plant; each seedling was not closely checked and identified. It was, however, generally observed that the seedlings from a given parent bore close resemblance to one another and to the parent, but

no accurate data were obtained of the variations that occurred. Many thousands of achenes have been dealt with. In germination tests samples of 100 achenes were used, replicated three times; in pot work 100 or 200 achenes were used and, sowing in the open, 200 to 500 achenes were counted out and replicates were employed. Only average figures are presented.

EXPERIMENT NO. I, 1929.—TO TEST THE INFLUENCE OF REMOVING THE HARD COVERING OF THE ACHENES.

(a) *Treatment with Sulphuric Acid.*—By exposing achenes to strong sulphuric acid the thick woody covering was charred and decomposed. From the results of a series of small tests it was found that exposure for three hours greatly reduced the thickness of the covering, but did not, as a general rule, result in its complete destruction; the seed remained intact and apparently normal. After treatment the achenes were separated from adhering acid by first draining any liquid from them and by subsequent prolonged washing in running water for eighteen hours. Tests then revealed the water and the achenes to be free from acid. Controls, achenes soaked for twenty-one hours in water before sowing, were tested along with the acid-treated achenes. The tests were carried out in a germination tank and in the open ground, sowing taking place on March 21. Table II shows the germination of achenes treated with concentrated sulphuric acid before sowing.

TABLE II.

Species.	% Germination in 3 months.		% Germination in 15 months.	
	acid.	control.	acid.	control.
<i>× calocarpa</i>	48	29	58	43
<i>cinnamomea</i>	5	0	8	12
<i>canina</i> var. <i>dumalis</i>	4	0	35	33
<i>gymnocarpa</i>	0	0	36	14
<i>nuthana</i>	0	0	31	20
<i>pomifera</i>	0	0	40	23
<i>rubiginosa</i>	0	0	34	40
<i>rubrifolia</i>	1	2	22	44
<i>Moyesii</i>	0	0	3	11
<i>virginiana</i>	11	2	16	26
<i>virginiana</i>	0	0	13	24
<i>Woodsii</i>	6	4	7	17

It cannot be claimed that the treatment with sulphuric acid generally accelerated germination; *R. × calocarpa* proved an exception, a real acceleration of approximately 20 per cent. being recorded. The acid treatment did not impair germination generally, as the subsequent counts of seedlings show. The treated achenes germinated as well but not better than seeds soaked in water. The acid treatment for three hours may be dismissed as being without much effect. A similar result was obtained from the tests carried out at 18° C. to 22° C. in the germination tank.

Whilst it is difficult to judge exactly how long to leave the achenes in strong acid to decompose the woody coverings and leave the seed intact, the treatment given removed a great deal of the thicker covering. Had germination been delayed by inability of the embryo to obtain water through an impervious covering, it is highly possible that the rate of water uptake would have been improved by decomposing the covering unless the only obstacle to water uptake was entirely situated or localized in the innermost layers.

(b) *Mechanical Treatment of Achenes*.—The above experimental evidence was confirmed by breaking the woody covering of each individual achene before placing it in water. There appeared to be no mechanical hindrance to the uptake of water other than that caused by the epidermal layers of the embryo itself. Twelve species were tested and no immediate germination took place.

It was concluded that germination was not delayed by inability to obtain an adequate supply of water.

EXPERIMENT NO. 2, 1930-1931.—TO TEST THE INFLUENCE OF INCREASED OXYGEN.

(a) Samples of achenes stored at laboratory and low temperatures for two months were thoroughly washed in tap water and then in dilute mercuric bichloride solution of concentration 1×10^4 . After counting they were placed in sterile flasks containing moistened filter pads and a little water. By a strong rapid stream of oxygen the air was swept out of the flasks, which were then hermetically sealed with waxed rubber stoppers. For six months the samples remained in the flasks at from 15 to 19° C. No germination took place during this time. On opening the flasks much oxygen remained. The achenes were then sown in the open ground to test their viability, but immediate germination did not occur.

(b) To be sure that the oxygen reached the seed other samples were taken and the woody covering of each achene cut before they were placed in the flasks. The treatment given was as in Experiment (a) above. No immediate germination took place in the flasks.

To ensure that no impurities in the gas or other faults of technique were responsible for the results, samples of lettuce and wheat were treated in exactly the same manner. With lettuce over 95 per cent. of the seeds produced radicles more than 4 mm. within 50 hours, and of wheat within 100 hours 98 per cent. had germinated.

The roses tested were *R. cinnamomea*, *R. blanda*, *R. × calocarpa*, *R. canina* var. *dumalis*, *R. canina* var. *glauca*, *R. × Chabertii*, *R. Davidi*, *R. × Dupontii* (*gallica × moschata*), *R. Ernestii*, *R. nuthana*, *R. multibracteata*, *R. rubiginosa*, *R. scabrata*, *R. virginiana*.

The subsequent germination of the achenes placed in the open ground was poor. Species that had previously germinated slowly but fairly well showed a slight reduction in the number germinating. The high concentration of oxygen had, however, not killed all the seeds.



FIG. 125 —*CEPHALOCEREUS SENILIS* IN CALIFORNIA.

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FIG 126 --ALOE SALM-DYCKIANA IN CALIFORNIA.



FIG. 127.- AGAVE HUACHUENSIS IN CALIFORNIA



FIG. 128.—*AGAVE ATTENUATA* IN CALIFORNIA.

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EXPERIMENT No. 3, 1929-1930.—TO TEST THE INFLUENCE OF COLD STORAGE—2 MONTHS.

(a) Achenes gathered in Autumn 1929 were placed in a cold store at -2° C. to 2° C. for two months—December and January. Samples were withdrawn, counted, and their germination tested in a Copenhagen tank along with control samples from seeds stored at laboratory temperature. During the period of cold storage the achenes were dry. The germination tank was maintained at 16° C. to 18° C. for eighteen hours and 20° C. to 22° C. for six hours daily; the test was concluded after ten weeks.

The entire range of samples tested did not germinate at once, with the exception of *R. × calocarpa*, which produced a few (3 per cent.) seedlings.

(b) Similarly achenes stored dry at 5° C. to 9° C. for two months showed no immediate germination.

The species tested were *R. cinnamomea*, *R. canina* var. *dumalis*, *R. × calocarpa*, *R. virginiana*, *R. pomifera*, *R. nutkana*.

Dry cool storage for two months did not cause immediate germination.

EXPERIMENT No. 4, 1930-1931.—TO TEST THE INFLUENCE OF COLD STORAGE FOR 2 MONTHS.

This experiment was a repetition of Experiment No. 3, which had been carried out a year previously. The samples were collected in October, and remained in the fruits slowly drying for a period of two months before they were cleaned and placed in the cold store. In other details of cold storage, the procedure was precisely similar to Experiment No. 3. On testing the samples, with controls, immediate germination did not take place. The percentage germinating in open ground after fifteen months showed only a very slight reduction caused by cold dry storage. The varieties and species tested were *R. cinnamomea*, *R. × calocarpa*, *R. × Dupontii*, *R. pineliensis*, *R. Jundzillii*, *R. multibracteata*, *R. mollis*, *R. nutkana*, *R. virginiana* and *R. acicularis*.

The behaviour of these species confirmed that of the species in Experiment No. 3.

EXPERIMENT No. 5, 1929-1930.—TO TEST THE INFLUENCE OF COLD STORAGE FOR 2 MONTHS—SOWING IN SOIL.

Counted samples withdrawn from cold storage after two months at -2° C. to 2° C. and 5° C. to 9° C. were sown in a sandy compost in pots placed in a cool germination house, together with samples stored at laboratory temperature. Generally germination was slow, only a few seedlings were obtained in three months; when germination took place the percentage of seedlings obtained was not increased by the cold storage, thus confirming Experiment No. 1 where a germination

tank was used. The species tested were *R. acicularis*, *R. baicalensis*, *R. × calocarpa*, *R. cinnamomea*, *R. canina* var. *dumalis*, *R. × Dupontii*, *R. gymnocarpa*, *R. Jundzillii*, *R. mollis*, *R. multibracteata*, *R. nutkana*, *R. pomifera*, *R. rubiginosa*, *R. rugosa*, *R. Moyesii*, *R. virginiana*, *R. Woodsii*. The germination of species producing more than 10 per cent. of seedlings in three months is shown.

TABLE III.

Species.	Air-stored control.	Stored at -2° C. to 2° C.	Stored at 5° C. to 9° C.
<i>× calocarpa</i> . .	21	25	33
<i>rugosa</i> . .	26	34	13
<i>Woodsii</i> . .	29	24	13

EXPERIMENT No. 6, 1929-1930.—TO TEST THE INFLUENCE OF COLD STORAGE FOR 4 MONTHS.

(a) Samples were withdrawn after a period of four months at -2° C. to 2° C. and their germination tested with air-stored achenes as controls. There was no general germination in within eight weeks.

(b) Similarly samples stored at 5° C. to 9° C. for four months failed to germinate satisfactorily at once.

The species tested were *R. acicularis*, *R. gymnocarpa*, *R. mollis*, *R. nutkana*, *R. pomifera*, *R. rubiginosa*, *R. virginiana*, *R. Woodsii*.

A few seedlings of *rubiginosa* and *Woodsii* were obtained. Dry cool storage for four months did not cause immediate germination.

EXPERIMENT No. 7, 1929-1930.—TO TEST THE INFLUENCE OF COLD STORAGE FOR 8 MONTHS.

Samples were withdrawn from cold storage at -2° C. to 2° C. and 5° C. to 9° C. in June, and, after counting the achenes, sowing took place in the open ground along with control seeds stored at laboratory temperatures. No immediate germination took place and no seedlings were visible in three months' time. Fifteen months after sowing a number of seedlings were established. The prolonged period of cold dry storage failed to cause immediate germination, and caused, in the case of *R. pomifera* and *Woodsii*, a slight reduction in the number of seedlings obtained in fifteen months. The species tested were *R. calocarpa*, *R. gymnocarpa*, *R. mollis*, *R. nutkana*, *R. pomifera*, *R. rubiginosa*, *R. virginiana*, *R. Woodsii*.

EXPERIMENT No. 8, 1930-1931.—TO TEST THE INFLUENCE OF COLD DRY STORAGE FOR $5\frac{1}{2}$ MONTHS AND 7 MONTHS.

(a) This experiment is a repetition of Experiments Nos. 6 and 7.

Samples were withdrawn from cold dry storage in April and tested against control samples stored at laboratory temperatures. General

immediate germination did not occur either in the open ground, in pots placed in a cool house, nor in a Copenhagen germination tank. The species and varieties tested were *R. canina* var. *glauca*, *R. cinnamomea*, *R. × calocarpa*, *R. Davidi*, *R. pineliensis*, *R. gymnocarpa*, *R. Jundzillii*, *R. mollis*, *R. nutkana*, *R. rubiginosa*, *R. scabrata*, *R. virginiana*.

(b) Other samples were withdrawn after seven months at -2° C. to 2° C. and at 5° C. to 9° C. The experiment was similar to Experiment (a) above. General immediate germination did not result from the treatments. The species and varieties tested were *R. × calocarpa*, *R. × Chabertii*, *R. gallica*, *R. canina* var. *glauca*, *R. canina* var. *pulverulenta*, *R. nutkana*, *R. Ernestii*, *R. rubiginosa*, *R. scabrata*.

EXPERIMENT NO. 9, 1929-1930.—GERMINATION TESTS AT LOW TEMPERATURES.

The temperature at which germination tests were carried out in a Copenhagen tank and in sandy compost in pots was of the order of 10° C. to 20° C. It was decided to test achenes at -2° C. to 2° C. and 5° C. to 9° C. Counted samples of achenes stored in the laboratory from October to February were well washed in distilled water, and in distilled water with 1 part in 10^6 mercuric bichloride, and placed on sterilized filter pads in sterilized petri dishes to which 5 c.c. of distilled water was added. At the lower temperature no immediate germination took place, the samples remained four weeks and were then sown in the open ground. Fifteen months later approximately 33 per cent. of the achenes had germinated.

The species included *R. Jundzillii*, *R. mollis*, *R. nutkana*, *R. pomifera*, *R. rubiginosa*, and *R. acicularis*.

EXPERIMENT NO. 10, 1929-1930.—TO TEST THE INFLUENCE OF ALTERNATING TEMPERATURES.

(a) Samples of achenes were placed in the cold store at -2° C. to 2° C. and were daily withdrawn for two hours to the laboratory temperature of from 13° C. to 19° C., and then replaced in the cold store. Germination tests were carried out both in sand in pots and in a Copenhagen tank after one month of this treatment. No immediate germination took place. Samples sown in the open ground germinated very slowly, as did untreated control samples producing seedlings in fifteen months. The species tested included *R. rubiginosa* (two samples from different sources), *R. pomifera* and *R. nutkana*.

(b) From other samples held at -2° C. to 2° C. for two months smaller samples were withdrawn to 13° C. to 20° C. for a week, and then returned to the lower temperature. This treatment was continued for two months, but it failed to cause immediate germination of the seeds of the species tested.

EXPERIMENT NO. 13, 1929-1930.—TO TEST THE EFFECT OF SOAKING THE ACHENES IN WATER AFTER STORAGE.

In December samples were withdrawn from dry storage after two months at -2°C. to 2°C. , from storage at 5°C. to 9°C. , and from air storage at laboratory temperature. One half of each sample was soaked in a large excess of distilled water for fifty hours—the other half remained dry until sowing. Replications of each species and treatment were employed. Sowing took place in December—the pots containing the achenes were placed in a cool house. The achenes were sown at $\frac{1}{16}$ inch approximately below the surface of the sandy compost. The percentage establishment of the subsequent seedlings is shown in Table V.

TABLE V.

To Show the Percentage Germination and Establishment in Six Months.
Seed Sown after Two Months' Storage.

Species.	Average Percentage of Seedlings.					
	Stored at -2°C. to 2°C.		Stored at 5°C. to 9°C.		Stored at 12°C. to 19°C.	
	Soaked.	Unsoaked.	Soaked.	Unsoaked.	Soaked.	Unsoaked.
<i>baicalensis</i> . . .	0	1	0	0	0	0
\times <i>calocarpa</i> . . .	22	20	25	18	39	38
<i>multibracteata</i> . . .	2	1	0	0	14	0
<i>rubiginosa</i> . . .	20	20	17	15	14	15
<i>virginiana</i> . . .	58	17	—	—	60	6
<i>pomifera</i> . . .	0	0	0	0	0	0
<i>rubrifolia</i> . . .	1	1	0	0	0	0

— = not determined.

With *R. virginiana* soaking the achenes caused a marked acceleration of germination. With six other species this effect was not observed; only a possible indication of a similar effect was obtained with *R. multibracteata*, in which achenes stored at laboratory temperatures responded in a slight degree to pre-soaking. The influence of two months' cold dry storage was again seen to be negligible; the storage did not in itself accelerate germination, nor did it so alter the achenes as to make them more susceptible to soaking. The only responsive species, *R. virginiana*, proved equally responsive without cold storage.

EXPERIMENT NO. 14, 1930-1931.—TO TEST THE INFLUENCE ON GERMINATION OF COLD STORAGE IN WATER AND IN AN ACID MEDIUM.

(a) *One month.*—After a short period of air storage during autumn and early winter samples were placed in cold storage (-2°C. to 2°C.) in layers of moistened moss gathered from the common. The storage medium contained *Sphagnum*, *Polytrichum*, and a small proportion

of dead pine needles. On pressing the moss litter a solution of p_H 5.2 to 5.5 was exuded. During the period of storage at -2° C. to 2° C. in the dark the *Polytrichum* and *Sphagnum* did not decay appreciably in one month. Samples of achenes were withdrawn and counted, sown in the open, and tested in a germination tank. No general stimulation to immediate germination had taken place in the achenes of the species tested—viz. *R. × calocarpa*, *R. Davidi*, *R. canina* var. *dumalis*, *R. canina* var. *glauca*, *R. Jundzillii*, *R. nuthana*, *R. Ernestii*, *R. scabrata*.

(b) *Two months*.—In this experiment samples were also held at 5° C. to 9° C. in water of p_H 7.2. The period of cool storage was continued for two months, when further samples were withdrawn and tested in the open ground and in a germination tank. With the exception of *R. × calocarpa*, which produced 25 per cent. of seedlings in three months, very few seedlings were quickly obtained. Fifteen months after sowing the germination figures were low, and no particular improvement had been caused by the cool moist storage. The species tested were *R. × calocarpa*, *R. × Chabertii*, *R. canina* var. *glauca*, *R. canina* var. *pulverulenta*, *R. himalaica*, *R. Jundzillii*, *R. nuthana*, *R. rubiginosa*.

(c) *Five months*.—Samples withdrawn from moist storage at -2° C. to 2° C. and from 5° C. to 9° C. did not immediately germinate when sown. The species tested included *R. gallica*, *R. canina* var. *glauca*, *R. canina* var. *pulverulenta*, *R. × Chabertii*, *R. nuthana*, *R. Ernestii*, *R. rubiginosa*, *R. scabrata*.

From these experiments it was seen that cold storage, with reasonably steady temperature, in water did not result in prompt germination of the species tested.

EXPERIMENT NO. 15, 1931-1932.—TO TEST THE EFFECT ON GERMINATION OF STRATIFICATION, COLD DRY STORAGE AND COLD STORAGE IN MOIST SAND.

This experiment was designed to test stratification again and the effect of moist sand as a cold storage medium; the sand was placed in pots and the achenes covered by $1\frac{1}{2}$ inch of sand. The following treatments were carried out from December 2, 1931, to March 10, 1932:

- A. Stratification in large pots in open ground.
- B. Cold dry storage, -2° C. to 2° C.
 - b. Cold moist storage in sand, -2° C. to 2° C.
- C. Cool dry storage, 5° C. to 9° C.
 - c. Cool moist storage in sand, 5° C. to 9° C.
- D. Controls dry at laboratory temperatures.

Sowing took place in the open ground in mid-March. Table VI shows the average percentage germination at three months and at fifteen months.

TABLE VI.

Species	Average Percentage Germination in 3 months.						Average Percentage Germination in 15 months.					
	Strat.	Dry Cold.	Cold Sand.	Cool Dry.	Cool Sand.	Dry.	Strat.	Dry Cold.	Cold Sand.	Cool Dry.	Cool Sand.	Dry.
	A.	B.	b.	C.	c.	D.	A.	B.	b.	C.	c.	D.
<i>blanda</i>	3	0	8	0	0	0	2	35	49	1	1	10
× <i>calocarpa</i>	14	0	14	14	0	20	19	2	16	20	6	20
× <i>Chabertii</i>	4	0	10	0	0	2	6	0	11	2	1	3
<i>cinnamomea</i>	16	0	3	1	0	1	19	0	20	0	1	2
<i>pinhensis</i>	1	0	0	0	0	0	3	11	13	0	0	10
<i>canina</i> var.												
<i>dumalis</i>	0	0	0	0	0	0	3	9	21	0	2	0
<i>gymnocarpa</i>	0	0	0	0	0	0	1	0	1	0	1	1
<i>multibracteata</i>	5	0	0	0	0	0	8	2	0	0	0	0
<i>mollis</i>	1	0	0	0	0	0	1	0	0	0	0	0
<i>oxyodon</i>	2	0	14	0	0	0	3	0	21	0	0	0
<i>rubiginosa</i>	5	0	4	0	0	0	9	18	18	0	0	1
<i>rugosa</i>	32	0	44	0	0	0	38	1	45	44	0	0
<i>Moyesii</i>	8	0	4	0	0	0	8	0	0	4	3	0
<i>sericea</i>	8	0	12	0	0	1	12	1	13	4	0	1
<i>virginiana</i>	20	0	15	0	0	0	28	1	16	4	0	0
<i>Woodsii</i>	5	0	1	0	0	0	10	4	0	1	12	32
Average (approx)	8	0	8	0	0	0	11	5	15	6	2	5

Table VI shows that immediate germination occurred to a very limited extent (approx. 8 per cent. in samples of achenes stratified in the open and also in samples kept moist and cold (-2°C. to 2°C.) in sand). No immediate germination occurred in samples stored dry. After fifteen months the advantage shown by these treatments was maintained, as germination and establishment of samples treated in other ways was very slow, amounting to 5 per cent. only.

B. (b) A further sample of these species remained in the cold dry storage until May, making a six months' period; when tested the germination in four months averaged about 6 per cent., showing no material improvement over the $3\frac{1}{2}$ months' treatment thus confirming previous tests.

EXPERIMENT NO. 16, 1932-1933.—TO TEST A FEW SPECIES BY SEVERAL TREATMENTS, INCLUDING COLD STORAGE IN MOIST SAND.

In this experiment it was decided to limit the number of species tested to a few, including *R. rugosa* and × *calocarpa* which had previously germinated more readily, and to include *R. canina* which previously had germinated more slowly, and at the same time to increase the number of treatments, including cold storage dry, in moist sand and in water. The following treatments of the achenes were carried out:

- Stratification in large pots, in sand, from 21/10/32 to 27/3/33.
- Cold dry storage, -2°C. to 2°C. , from 26/10/32 to 27/3/33.
- Cold wet storage, achenes in ice and water, -2°C. to 2°C. , with trace of HgCl_2 , 1 in 10⁶ added, from 28/10/32 to 27/3/33.



FIG. 129.—EBENUS CRETICUS.
(p. 375)



FIG. 130.- *NOMOCHARIS OXYPEIATA*

[To face p. 413.]

- D. Cold moist storage, achenes in moist sand in pots, at -2°C. to 2°C. from 28/10/32 to 27/3/33.
 E. Cool storage, dry, 5°C. to 9°C. from 26/10/32 to 27/3/33.
 F. Cool wet storage, achenes in water, 5°C. to 9°C. , 28/10/32 to 27/3/33 (trace of HgCl_2).
 G. Cool moist storage, achenes in moist sand, in pots, at 5°C. to 9°C. , from 21/10/32 to 27/3/33.
 H. Air storage, dry, at laboratory temperature, 12°C. to 19°C. , from 28/10/32 to 27/3/33.

(In all treatments the achenes were in darkness.)

The average percentage figures of establishments are shown in Table VII.

TABLE VII.

Showing the Percentage Establishment of Seedlings.

Three months after sowing.

Species and Variety.	A. Strat.	B. Cold Dry.	C. Cold Water.	D. Cold Sand.	E. Cool Dry.	F. Cool Water.	G. Cool Sand.	H. Lab. Dry.
<i>R. canina</i> (1)	0	0	0	0	0	0	0	0
<i>R. canina</i> (2)	0	0	0	0	0	0	0	0
<i>R. canina duma-</i> <i>lis</i> (3)	0	0	0	0	0	0	0	0
<i>rugosa</i>	19	0	8	16	0	18	1	0
\times <i>calocarpa</i>	25	2	7	15	0	14	11	0
<i>cinnamomea</i>	12	0	23	5	0	0	0	0
<i>Fifteen months after sowing.</i>								
<i>R. canina</i> (1)	12	1	13	23	13	7	5	13
<i>R. canina</i> (2)	1	1	9	12	36	15	5	12
<i>R. canina duma-</i> <i>lis</i> (3)	1	5	23	26	31	17	2	25
<i>rugosa</i>	24	1	—	20	7	31	13	18
\times <i>calocarpa</i>	26	3	7	19	2	17	24	18
<i>cinnamomea</i>	13	23	23	8	19	11	0	11

From the data in the table it is seen that achenes stored dry either at -2°C. to 2°C. or at 5°C. to 9°C. or at laboratory temperature did not germinate rapidly. Whereas certain treatments accelerated the germination of some of the achenes of *R. rugosa* and its hybrid *calocarpa* and *R. cinnamomea*, no treatment caused immediate germination of the three samples of *R. canina* tested. The treatments which hastened the germination of *R. rugosa* were stratification in sand in the open, in sand in pots in the cold, and in water at low temperatures. It appears that low temperatures and adequate moisture are both necessary for the acceleration of germination. Fifteen months after sowing the *R. canina* samples had germinated to a limited extent. Of the various treatments tested the moist treatments now held no great advantage over the dry treatments, neither did the lower storage temperature (-2°C. to 2°C.) result in higher germination than the higher temperature (5°C. to 9°C.)

EXPERIMENT NO. 17, 1933-1934.—TO TEST AUTUMN SOWING AND OTHER TREATMENTS.

It was decided to test the effect of immediate sowing of the achenes after their removal from the fruits in early autumn, as previous experiments had indicated that cool moist storage favoured germination. Other treatments were included for comparison and a number of species were tested. The various treatments were carried out from October 8 to March 12, as in the previous experiment. A large excess of water was used for the treatments (C) and (D) at the lower temperature (-2°C. to 2°C.); this was continually frozen for many days. Part of the data obtained is shown in Table VIII. It is seen that autumn sowing results in the germination of only a few seeds in the subsequent spring, and though the temperature conditions of the achenes during the winter must have been close to those of the stratified seeds, the resulting germination was not so good. Again cold dry storage has proved ineffective, prolonged storage in ice and water at low temperature for five months failed to accelerate germination, as did soaking in water at 5°C. to 9°C. for a similar period.

TABLE VIII.

Showing the Average Percentage Establishment.

Three months after spring sowing, i.e. in June.

Species.	A. Strat.	B. Cold Dry.	C. Cold Water. (ice).	D. Cold Sand.	E. Cool Dry.	F. Cool Water.	G. Cool Sand.	H. Lab. Dry.	I. Au- tumn Sown.
<i>baicalensis</i>	1	0	0	1	0	0	0	0	3
<i>canina</i>	27	0	0	1	0	0	0	0	7
<i>canina</i> var. <i>Andersonii</i>	0	0	0	0	0	0	0	0	1
<i>canina</i> var. <i>dumalis</i>	9	0	0	0	0	0	0	0	1
× <i>Chabertii</i>	2	0	0	23	0	0	1	0	5
<i>Jundzillii</i>	12	0	0	2	0	0	1	0	3
<i>mollis</i>	0	0	0	0	0	0	0	0	0
<i>pulverulenta</i>	36	0	0	1	0	0	0	0	7
<i>rugosa</i>	26	0	0	2	0	14	0	0	6
× <i>calocarpa</i>	18	0	0	0	0	7	6	0	20
<i>virginiana</i>	2	0	0	4	0	0	0	0	4

EXPERIMENT NO. 18, 1933-1934.—TO DETERMINE THE EFFECT OF THE FRUIT ON THE ACHENES.

(a) *Partially Ripened Fruits.*—Tests of partially ripened achenes from green fruits showed that the achenes from such fruits germinated very slowly and the total germination was poor. Species tested included *R. canina*, *R. Jundzillii*, *R. mollis* and *R. Moyesii*.

(b) *Storage in the Fruits.*—Samples of achenes were stratified in the fruits. The fruits decayed, and counted samples were subsequently

sown with the samples which had been cleaned from the fruits before treatment. Generally there was no material difference in the rate of germination of the two samples. Ten species were tested.

Similarly achenes in the fruits were submitted to other treatment, together with achenes cleaned from the fruits, and no difference was observed in the rate of germination of the samples. The species tested included *R. canina*, *R. rugosa*, *R. × calocarpa*, *R. pulverulenta*, *R. Jundzillii*, *R. mollis*, *R. virginiana*.

It was concluded, therefore, that the red fruit walls play a minor part in the after-ripening process in Nature; they serve, however, to keep the achenes moist until their walls are broken or decay.

Tests of Old Achenes.—Achenes stored dry for several years did not germinate rapidly when tested.

DISCUSSION.

The achenes collected contained apparently well-formed seeds. The removal or cutting of the hard pericarp of the achenes failed to cause rapid germination. High oxygen pressures and an adequate supply of water did not result in germination. It therefore appears that the embryo requires a period of after-ripening before germination. The experimental work indicated that the conditions of the environment influence this process. Dry storage at laboratory temperatures did not result in rapid germination. Dry storage at other temperatures (-2° C. to 2° C. and 5° C. to 9° C.) also proved ineffective; a range of temperatures from -2° C. to 22° C. was covered by the experiments. The fluctuations of temperature tried were also ineffective. Storage in water, and ice and water, and at 5° C. to 9° C. did not generally result in rapid germination. Occasionally, as in Experiment No. 13, soaking in water produced some acceleration.

Autumn sowing resulted in a few seedlings in late spring. Burying the seeds in moist sand, and stratification, caused an accelerated rate of germination. This was tested in several seasons with about twenty species and always gave positive results. In the laboratory storage of the seeds at more nearly constant temperature in similar coarse moistened sand generally caused some slight improvement in the rate of subsequent germination, but prolonged enclosure in ice failed to cause rapid germination. Fluctuations in temperature and moisture content appear necessary; such treatments, however, have attained a very limited success only, infrequently causing one achene in three to germinate rapidly. The remainder germinate slowly over a period of several years. The influence of the storage conditions may show its effect in the first season, but in the subsequent seasons the general slow germination of other achenes lying in the soil for one year takes place, and after a period of eighteen months there is not such a great difference between samples of the same species.

A comparison of the species available shows that whilst *R. rugosa* and its hybrid *calocarpa* produce seed germinating more readily than

the majority of the species available, *R. canina* and its varieties generally germinate slowly. Fertilization in pentaploid roses is irregular, and HURST (9) has shown that apomixis occurs in the Caninae. It would appear possible that apomictical growth is related to slow germination.

The study of problems of after-ripening and dormancy has been pursued by CROCKER and his associates at the Boyce Thompson Institute, New York. With Rosaceous seeds the necessity of an after-ripening period was established for apples by HARRINGTON and HITE (7), who found moist cool storage effective. With *Sorbus Aucuparia* low temperature and stratification proved effective when chemical methods failed to stimulate the seeds to germinate in the tests made by FLEMION (6). Similar conditions accelerated the germination of birch seeds, but freezing was proved by JOSEPH (10) to be injurious to the seed. CROCKER and BARTON (3) worked with a number of Rosaceous species and included nine species of *Rosa* itself in their tests; they found that stratification at low temperature accelerated the germination. Granulated peat proved to be a satisfactory medium in which to keep the achenes at temperatures of 5° C. to 10° C. They found 5° C. to be a satisfactory storage temperature for roses. CROCKER and BARTON (3) extended their observations to other genera, including *Pyrus*, *Prunus* and *Cotoneaster*.

The work as a whole indicates that low temperatures, preferably between 4° C. and 10° C., favour after-ripening and subsequent germination.

CALVINO (1) reports a number of treatments that accelerate germination and also improve the percentage of germination. Steeping in weak solutions of Kresol mercury hydrate (1 part in 1000) for one hour caused an increase of '33 per cent. in total germination, for six hours an increase of 20 per cent., soaking in water six hours an increase of 16 per cent. Germination was accelerated by one month by keeping the seeds at 0° C. for sixteen days; it is not stated whether the achenes were dry or not, but presumably they were dry, for soaking in water for seven hours is also quoted as accelerating germination. Other periods of soaking in water are reported to have caused an increased rate of germination. CALVINO also reported that mature fruits produced achenes germinating more rapidly. As the species and hybrids tested are not reported it is idle to compare the detailed results, but in general there is agreement between CALVINO's results and those reported in this paper in regard to low temperature storage, and some signs of increased germination as a result of soaking have also been found to confirm CALVINO's results. It is stated in CALVINO's paper that "10° C. for 3 hours advanced germination one month." No substantiation of this claim has been obtained from the Wisley experiments: it may be that an error in the report exists in this one case.

In conclusion, it is definitely established that some acceleration of the germination of rose seeds can be caused by storing the seeds in moist sand or other medium at a cool temperature of -2° C. to 2° C., or at 5° C., or in the soil in autumn and winter. Low temperatures

(-2° C. to 2° C.) accompanied by dry conditions do not accelerate germination by shortening the period of after-ripening; moisture is necessary, aeration is also needed.

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The writer expresses his thanks to the Entomologist, G. Fox Wilson, for the identification of the puparia of *Spilograpta alternata*.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

***Aerides odoratum album*.** A.M. July 2, 1935. A pure-white form of this elegant and well-known species. From Sir Jeremiah Colman, Bt., Gatton Park, Surrey.

***Alstroemeria aurantiaca* 'Dover Orange.'** A.M. July 16, 1935. From Messrs. Clark, Dover. A deep orange variety of this well-known herbaceous plant. The two upper petals have small crimson streaks on a yellow blotch. The height of the plant is about 2½ feet, and the flower stems are very stiff and erect.

***Anthemis Sanetti-Johannis*.** A.M. July 2, 1935. From N. K. Gould, Esq., West Byfleet. A Bulgarian species, discovered in woods above the Rila Monastery in 1926, at altitudes of 4000–5000 feet. The flower-heads are 2 inches in diameter, the rays intense orange, the disc a shade paler. The 2-foot stems, like the finely-divided foliage, are grey-green and somewhat hairy. Grows well in full sun in well-drained soil.

Border Carnation 'Happiness.' A.M. July 16, 1935. Shown by Messrs. Allwood Bros., Haywards Heath. A fancy variety of good form, with a yellow ground flaked and margined with cerise-scarlet.

Border Carnation 'Renée Nichols.' A.M. July 23, 1935. Shown by F. W. Nichols, Esq., Woodrock Road, Woolton, Liverpool. A picotee variety of good form, creamy-yellow ground with very narrow deep maroon margins, slightly scented.

Border Carnation 'Windsor Clove.' A.M. July 23, 1933. Raised and shown by Mr. C. H. Cook, The Royal Gardens, Windsor. A hardy vigorous grower and a profuse flowerer; flowers deep rich crimson, clove scented.

***Campanula grandis*, Highcliffe var.** A.M. July 2, 1935. From Messrs. Prichard, Christchurch. A good form of this useful hardy border plant. It grows about 3 feet tall, and freely produces stiff erect stems closely set with large wide-open flattish violet flowers.

***Campanula pilosa*.** A.M. July 2, 1935. From Lt.-Col. C. H. Grey, D.S.O., Cranbrook. A Japanese species suitable for the alpine house or rock garden. The small, conical, lavender-blue flowers are borne singly on erect stems 4 inches high. The leaves are ½–1 inch long, spatulate, with 3 or 4 fine teeth on each margin.

***Campanula* × *rotarvatica*.** A.M. July 16, 1935. From R. C. Tyler, Esq., Chaldon, Surrey. A very floriferous hybrid raised from the cross *C. rotundifolia* × *C. arvensis*. It produces numerous semi-erect growths 4 to 5 inches high clothed with small, ovate-orbicular, toothed leaves and bearing small, lavender bells with spreading lobes.

***Castanopsis chrysophylla*.** A.M. July 30, 1935. From Mr. R. C. Notcutt, Woodbridge. A somewhat uncommon Californian tree,

capable of attaining a height of 50 or 60 feet, but very attractive in all stages of its development. The leaves are evergreen, ovate-oblong, entire, dark green and lustrous above, covered beneath with golden-yellow scales. The fruits, resembling small chestnuts, are freely borne.

Cattleya × '**Lorna**' var. '**Corona**.' A.M. July 16, 1935. From N. Prinsep, Esq., The Boxes, Pevensy. (C. × '**Enid**' × C. *Warszewiczii*.) The spike bore two large, well-formed flowers in which the sepals and petals are pure white, and the labellum rich purple with a narrow white border and a yellow throat.

Cypripedium × '**Clair de Lune**.' A.M. July 16, 1935. From Mr. D. A. Cowan, 118 Hook Rise, Surbiton. (C. × '**Alma Gevaert**' × C. × '**Emerald**.) Flower well above the usual size; the large dorsal sepal is white with vertical lines of emerald green, while the petals and labellum are light greenish.

Delphinium '**Betty**.' A.M. June 27, 1935. Shown by Mr. T. Stevenson, Hillingdon. Flower spikes of medium length with semi-double flowers, 2 inches across, flat, outer petals Cambridge-blue, inner clear pale pinkish-mauve, giving a pale mauve effect; eye white.

Delphinium '**Blue Beauty**.' A.M. June 27, 1935. Raised by Mr. E. Watkin Samuel and shown by Messrs. Bees, Ltd., Chester. Flower spikes tapering, with very closely arranged single flowers, 2½ to 3 inches diameter, bright forget-me-not blue delicately flushed pale pinkish-mauve; eye black.

Delphinium '**Codsall Lad**.' A.M. June 27, 1935. Raised by Mr. E. Watkin Samuel and shown by Messrs. Bees. Ranunculus-flowered. Flower spikes tapering with very closely arranged double flowers, 2 inches across; outer petals violet-blue shaded purple, inner purplish-blue shaded deep mauve.

Delphinium '**Glory of Wales**.' A.M. July 16, 1935. Shown by Messrs. Bakers, Codsall, Wolverhampton. A Ranunculus-flowered variety. Flower spikes of medium length, flowers double, 2 inches across, forget-me-not blue flushed mauve, giving a general effect of light rosy-lavender.

Delphinium '**Italla**.' A.M. July 2, 1935. Raised and shown by Messrs. Blackmore & Langdon, Bath. Flower spikes long, tapering with closely arranged semi-double flowers, 3 to 3½ inches diameter, bright gentian-blue with delicate mauve flush; eye small, white.

Delphinium '**Lady Bowles**.' A.M. June 27, 1935. Raised and sent by Messrs. Chaplin Bros., Waltham Cross. Flower spikes somewhat tapering. Flowers flat, semi-double, 2 inches diameter; outer petals pale sky-blue, inner delicate pinkish-mauve with a conspicuous white eye.

Delphinium '**Laurent**.' A.M. June 27, 1935. Raised and shown by Messrs. Blackmore & Langdon, Bath. Flower spikes robust, long, tapering, symmetrical with semi-double, flat flowers, 2½ inches across; outer petals gentian-blue, inner flushed rosy-mauve; eye black.

Delphinium 'Monica Schofield.' A.M. July 16, 1935. Raised and shown by E. Schofield, Esq., Leventhorpe, Woodlesford, Leeds. Flower spikes long, somewhat tapering, with closely arranged semi-double flowers, 2-2½ inches across, pale cream with a medium-sized brown eye.

Delphinium 'Omega.' A.M. July 16, 1935. Raised and shown by Messrs. Blackmore & Langdon, Bath. Flower spikes long, somewhat tapering, with loosely arranged semi-double flowers 2-2½ inches across, deep sky-blue lightly flushed pinkish-mauve; eye large, dark brown with golden hairs. Late flowering.

Delphinium 'Wild Wales.' A.M. June 27, 1935. Raised by E. Watkin Samuel and shown by Messrs. Bees. Flower spikes tapering, with closely arranged single flowers, 3 to 3½ inches diameter, forget-me-not blue, margins of petals flushed pinkish-mauve; eye black.

Dierama pulcherrimum 'Port Wine.' A.M. July 30, 1935. From Viscountess Byng of Vimy. An unusually dark-coloured variety with flowers of rich, purplish-crimson.

Dracocephalum Isabellae. A.M. July 2, 1935. From C. T. Musgrave, Esq., V.M.H., Godalming. A very attractive hardy herbaceous plant discovered by Forrest in Western Yunnan and named in honour of his sister. It is an erect plant with somewhat hairy stems clothed with dark green, sessile leaves, each divided to the base into 5 or 7 linear-lanceolate segments. The dense terminal inflorescence is made up of several whorls of flowers. The purplish-green, tubular calyx is densely woolly, the violet corolla tubular, hooded, with a divided, spreading lip.

Epidendrum subpatens. A.M. July 16, 1935. From Sir Jeremiah Colman, Bt., Gatton Park, Surrey. An elegant species from Central America. The slender reed-like stem bore a pendulous spike of 34 flowers, with creamy-green sepals and petals and a whitish labellum.

Evolvulus alsinoides. A.M. July 16, 1935. From T. Hay, Esq., Hyde Park, London, W. 2. A dainty plant with many wiry, spreading shoots up to a foot long, each producing a long succession of small, flat, sky-blue flowers from the axils of small, lanceolate, pilose leaves. Suitable for the alpine house.

Gazania pinnata var. scabra. A.M. July 30, 1935. From Messrs. Sutton & Sons, Reading. A very striking, large-flowered variety. The pinnately lobed leaves are 4 inches long, grey-green and scabrous above, white beneath. The flower-heads are over 4 inches across, with twenty rays surrounding a bright yellow disc. The rays are widely spatulate, orange with a central splash of crimson and a light coffee-coloured basal zone.

Hellechrysum bracteatum. A.M. July 16, 1935. From Mr. Ernest Ladhams, Elstead. An attractive plant for a sunny spot, where it will form a rounded bush a foot high. The flowers are freely borne and last for a long period. The glistening flower-heads are buttercup-yellow with orange centres.

Jacaranda ovalifolia. A.M. July 2, 1935. From Mrs. Raymond Courage, Banbury. This is better known as *Jacaranda mimosaeifolia*, and is a handsome shrub or tree with large bipinnate leaves and terminal panicles of bell-shaped, lavender flowers. Suitable only for the greenhouse in this country, but extensively planted in the tropics, where it forms a tall tree.

Lilium 'Grace Marshall.' A.M. July 2, 1935. From Lt.-Col. G. S. F. Napier, Horam, Sussex. One of the many beautiful hybrid Lilies raised by Miss Preston of Ottawa. The plant exhibited was nearly 3 feet tall, the erect, chocolate-coloured stem covered with narrow, spreading leaves and bearing an inflorescence of 15 flowers. The flower is very firm and waxy in appearance, with recurving segments of deep orange-scarlet, flecked with small chocolate spots. The parents were *L. Willmottiae* \times *L. dauricum* seedling?

Linum hirsutum. A.M. July 16, 1935. From the Director, R.H.S. Gardens, Wisley. A beautiful species of bushy habit, nearly 2 feet in height. The slender stems are clothed with small, oblong-lanceolate, downy leaves and branch freely in the upper half. The flowers are fully 1½ inch across, soft lilac-mauve in colour.

Nymphaea zanzibariensis, Kew form. A.M. July 30, 1935. From the Director, Royal Botanic Gardens, Kew. A most beautiful water-lily, with flowers nearly a foot in diameter rising above large, glossy, orbicular leaves. The four sepals are triangular-ovate, green outside, lilac within; the elliptical petals, thirty-two in number, are rich lavender-blue and enclose a great cluster of golden stamens with deep blue apical appendages. Added to its striking colour scheme, the flower has a sweet, though faint, fragrance.

Pentstemon ambiguus. A.M. July 30, 1935. From Messrs. Sutton & Sons, Reading. A very distinct species, forming a bushy plant a foot high, with rather thick, linear leaves an inch long and numerous slender racemose inflorescences. The dainty flowers are tubular with five rounded, spreading lobes, rose-coloured externally, paler within.

Rhododendron 'Angelo.' A.M. June 18, 1935, as a hardy flowering shrub for general garden use. Shown by Lionel de Rothschild, Esq., Exbury, Hants. *R. Griffithianum* \times *R. Loderi*. Raised by the exhibitor and very much like *R. 'Albatross,'* Exbury var. which received a F.C.C. on June 4. Leaves oval, apiculate, base rounded or subcordate, 15–20 cm. long, including the stout petioles (2–3.5 cm. long), 4.5–7.5 cm. wide, dull green above, glaucous below. Flowers 9 or 10 inches, a shapely truss, 20–25 cm. in diameter; pedicels stout, 3.5–5 cm. long, like the rhachis and calyx, flushed with red and also finely white glandular-pubescent; calyx irregularly lobed, up to 1 cm. long; corolla with a funnel-shaped tube about 4 cm. long, and a wide-spreading limb about 13 cm. across, the lobes crisped and recurved, a delicate very slightly bluish-pink in colour, with deeper reddish-brown markings at the back of the tube within; stamens up to 5.5 cm. long with white glabrous filaments, over-topped by the style; ovary and style densely white glandular the whole length.

Rhododendron × '**Cineras.**' A.M. July 2, 1935. From E. J. P. Magor, Esq., St. Tudy, Cornwall. A beautiful hybrid raised by the exhibitor from the cross *R. cinnabarium* × *R. crassum*. The leaves are elliptic or oblanceolate, dark green and lustrous above, brown-scaly beneath, about 4 inches long. The flowers, which are carried in clusters of 6 at the branch-tips, are narrowly tubular with spreading, undulate lobes, creamy-white, occasionally flushed externally with rose.

Rose '**Percy Izzard.**' A.M. July 16, 1935. From Mr. H. Robinson, Hinckley. A Hybrid Tea variety resulting from a cross between 'May Wettern' and 'Barbara Richards.' The flowers are large and of good form; cream flushed with apricot and slightly tinted with pink at the edges of the petals.

Rose '**Phyllis Burden.**' A.M. July 30, 1935. From Messrs. B. R. Cant, Colchester. A Hybrid Tea variety resulting from a cross between two unnamed seedlings. The flowers are of medium size and good form; slightly scented; bright coral shaded with orange and having yellow patches at the base of the petals.

Teucrium orientale. A.M. July 30, 1935. From Messrs. Kelway & Son, Langport. A perennial plant a foot high, of bushy habit, with light, feathery panicles of small, lavender-violet flowers.

Vanda × '**Memoria T. Iwasaki.**' A.M. July 2, 1935. *V. Dearei* × *V. tricolor*. The flowers are buff-yellow marked with brown spots, the median lobe of the labellum light brown. From Messrs. Charlesworth, Haywards Heath.

Vuylstekeara × '**Hogira.**' A.M. July 2, 1935. A beautiful hybrid. *Odontoglossum* × '**Purple Queen**' × *Vuylstekeara* × '**Memoria J. Charlesworth.**' The spike bore 9 flowers, bright rich purple, the inner half of each sepal and petal shaded with crimson. From Messrs. Charlesworth.

GARDEN NOTES.

Some new Gentians.—Among the newer Gentians flowering at Bodnant this summer is one of a Kingdon Ward number (K.W. 10761) identified in the field notes as *G. sino-ornata*; this has already begun to flower freely. It is therefore six or seven weeks earlier than the type. The flower is of good colour, but smaller than that of the type. There is, of course, another early flowering form of this Gentian which is in cultivation and which is not worth growing as it does not open its flowers properly even in bright sun.

One flower of a white form of *G. sino-ornata* opened a fortnight ago just where a group of K.W. 10807 joins a group of Gentian identified as *G. sino-ornata* and collected by my collectors in China. Until the other plants in the two batches flower I do not know to which collector to attribute it. It has a good flower, large and, if one may judge from this one plant, of early flowering habit.

G. Georgei (K.W. 10765) is in bud, but on August 1, the date of writing this note, it is not possible to judge the quality of the bloom. It will be remembered, however, that Kingdon Ward says that the colour is purple.

The Lhagu Gentian (K.W. 10860), is well in flower with a good coloured bloom of medium size, but so like *G. Veitchiorum* that from a garden point of view it is very hard to distinguish them. Seedling plants of *G. Veitchiorum* are now well in bloom, but the older plants that were divided in the spring are only in bud.

Another Gentian which is quite pretty at the moment is *G. cachemirica*; it is somewhat variable in colour and not quite of the beauty of Gentians of the *Frigida* section.—Lord Aberconway, Bodnant.

Calceolaria Darwinii.—I find in Mr. STERN's interesting article on "Rock Plants," in the JOURNAL for May, that he has "never been able to keep *Calceolaria Darwinii* through the damp of the winter, though it is said to grow in damp places in Patagonia, but perhaps it is covered by snow there in winter."

I lived for sixteen years on farms near the eastern entrance to the Straits of Magellan on the mainland, and took a great interest in all the plant life there, in fact I have with me here a collection of all the plants and grasses that grew there. *Calceolaria Darwinii* is one of the commonest flowers there and grows in dense patches making quite a show, but it never grows in damp places. Not once have I seen a plant growing in good soil in the valleys, it is always found either on the steep slopes of ridges (mostly gravel), or on flats where the soil is gravel for some depth; the winters there are not dry, but very cold, the thermometer occasionally getting down to zero Fahrenheit. Some

years there is very little snow, and what comes does not always lie, other years the snow may be there for several months, but the ground invariably gets frozen for over one foot deep. So it would seem that drainage is what is needed for this curious little plant. *Oxalis enneaphylla rosea* was also very common there and I have seen a flat of several acres pink with it.—*Ronald H. Pye, Erfdeel, Cape Province, S. Africa.*

BOOK REVIEWS.

"Succulent Plants." By H. Jacobsen, authorized translation by Vera Higgins, M.A. 8vo. xvi + 293 pp. (Williams & Norgate, London, 1935.) 25s.

This book is primarily a companion to gardeners and those interested in the cultivation of succulent plants. As such it deals with that group of plants in a very thorough manner.

Although most genera of succulents are dealt with, the large American family of Cactaceae is not touched upon; in place thereof special attention is devoted to the South African members of the Aizoaceae.

Knowing many of these plants in their native habitat and thus the conditions under which they grow naturally, I would like to express my great pleasure in reading the introductory chapters dealing with the home of succulents, form and mode of life, uses and cultivation, and succulents in nursery practice. These chapters are extremely useful and interesting and form a considerable part of the book. The last chapter, however, is by far the most important for the following reason.

The subdivision of the old genus *Mesembryanthemum* Linn. is undoubtedly one of the most difficult and, as yet, most unsettled problems of South African systematic botany. Since 1921, when N. E. Brown first began to examine this genus critically, up to the present time approximately 150 new genera have been created, mainly by N. E. Brown, L. Bolus, G. Schwantes and K. Dinter. The result is that only a relatively small number of species are now retained in the old genus *Mesembryanthemum* L. Many of these genera are closely allied and thus difficult to distinguish merely by description. Jacobsen fully realized the value of illustrations in such cases. He deals with approximately 100 of these genera, citing where possible several species of each genus, and in most cases illustrating one or more species of the genus concerned. To quote examples: the book contains illustrations of 32 different species of *Lithops* and 27 species of *Conophytum*.

The book contains no fewer than 277 photographic reproductions illustrating over 300 species of succulent plants.

A special feature of this book is a list of species of the old genus *Mesembryanthemum* L. with their equivalents according to the more modern division of this genus, e.g.:

M. speciosum Haw. = *Drosanthemum speciosum* Schwant.
M. calcareum Marl. = *Titanopsis calcarea* Schwant.

Thus to anyone acquainted with the older specific denominations (as found in the Flora Capensis), this list is of the utmost value. Each species enumerated is furthermore followed by citation of the full synonymy.

The book is far from complete as regards the number of genera and species of Aizoaceae, as well as genera and species of other families enumerated. A key to the genera and species has not been included, as the author did not intend the work to be "scientific." Keys to genera and species, however, enhance the value of such publications, and should never be omitted. I am inclined to believe that Mr. Jacobsen has refrained from drawing up a key merely because he realizes that even experienced systematists, including those that have dealt with "Mesembs." in many of their activities, find it most difficult to run a plant to its correct genus. The key to the genera drawn up by N. E. Brown, and which was republished in translated form by von Poellnitz in Fedde's Repertorium, may be consulted by those who wish to study these plants seriously, but to my knowledge a satisfactory key does not yet exist.

A special word of praise is due to the splendid work of Mrs. Higgins, on whom fell the difficult task of translating the text from the German. The task has been accomplished in an admirable fashion.

Author, translator and publishers have collaborated to make an excellent compact volume at a reasonable price. I cannot do otherwise than recommend this volume to anyone interested in succulent plants, and am convinced that it will supply a long-felt want.

H. G. SCHWEICKERDT.

"The Teaching of Biology." By M. E. Phillips and L. E. Cox. 8vo. viii + 155 pp. (University Press, London, 1935.) 4s. 6d.

This is a book for the teacher, and every teacher should read it, for it is, especially in the early part, full of suggestion. The book consists of three parts: "The General Principles that underlie Biological Teaching," "General Method," and "Special Method"; and the authors have visualized the teaching of their subject to pupils of from five upwards. The difficulties of the matter are not glossed over, they are faced, and it is shown that in the hands of a capable and sympathetic teacher biology as a school subject is of very considerable value.

"Cacti and Other Succulents." By W. T. Neale. 8vo. 160 pp. (Neale, Newhaven, Sussex, 1935.)

This interesting little publication is a combination of book and catalogue. The first thirty pages are given up to introductory remarks and cultural notes, including some on propagation and control of insect pests. The catalogue itself is divided into two parts, the first dealing with Cacti, the second with other succulents (*Cotyledon*, *Euphorbia*, *Stapelia*, etc.). In both parts up-to-date nomenclature has been followed and spelling mistakes are creditably few; the fact that the names of the authors are placed in brackets after some species, and are omitted after others, though botanically incorrect, is not a defect which will worry most gardeners. The book concludes with 160 excellent photographic illustrations which will not only help growers to name their plants, but will convince them that it really is worth while waiting for the blooms of these interesting plants.

NOTES AND ABSTRACTS.

Aloe Cooperi Baker. (*Flow. Pl. S. Afr.*, t. 578; April 1935).—Native of Swaziland. Already figured in *Bot. Mag.*, t. 6377, but leaves here rather broader and flowers maturing successively from below upwards. An acaulescent species with long leaves.—F. J. C.

Aloe polyphylla Pillans. (*Flow. Pl. S. Afr.*, t. 571; April 1935).—A rosette species with leaves (75 to 100) in five rows. Flowering at about six years old, inflorescence branches about 18 inches high, flowers $1\frac{1}{2}$ inch long, orange and yellow, bracts violet. Native of Basutoland; in winter covered with snow.

F. J. C.

Anacampseros subnuda von Poellnitz. (*Flow. Pl. S. Afr.*, t. 576; April 1935).—Growing between stones on koppies, near Pretoria. An easily grown plant, with small green or grey leaves and pink flowers about an inch across.—F. J. C.

Anaphalis triplinervis var. *intermedia*. By H. K. Airy Shaw (*Bot. Mag.*, t. 9396; May 1935).—Native of the Western Himalaya, the type of the species being figured by Sims in the *Botanical Magazine* in 1824, when it was introduced from Nepal. The flowers are white and the leaves much narrower than in the original type. Hardy, about 6 inches to a foot high.—F. J. C.

Camellia reticulata Lindl. By J. R. Sealy (*Bot. Mag.*, t. 9397; May 1935).—The single form of the plant already twice figured in its double state in the *Botanical Magazine*. A tender shrub from Western Yunnan, collected by Forrest, now first identified as the wild plant from which older double flowered plants have been derived. A fine plant.—F. J. C.

Camptorrhiza Schlechteri (Engler) Phillips. (*Flow. Pl. S. Afr.*, t. 575; April 1935).—A new genus of Liliaceae is proposed for this plant, first called *Iphigenia Schlechteri*. It is a rhizomatous plant from near Pretoria, about 10 inches high, with small violet and green flowers and linear leaves.—F. J. C.

Celastrus orbiculatus. By H. K. Airy Shaw (*Bot. Mag.*, t. 9394; May 1935).—The plant commonly known as *C. articulatus*, a name due to a typographical error in 1784. A Japanese and Chinese species already figured in the *Botanical Magazine*. A hardy climber and notable for its brightly coloured fruits.—F. J. C.

Cremanthodium Delavayi Diels. By J. R. Sealy (*Bot. Mag.*, t. 9398; May 1935).—Native in Yunnan and Upper Burma. A herbaceous perennial with deltoid petiolate leaves and nodding pale yellow flowers somewhat like a small and ragged sunflower. The *Cremanthodiums* are not easy to accommodate and appear to need a moist, humous soil.—F. J. C.

Fatchodera × *Lisel* Guillaumin. By F. Ballard (*Bot. Mag.*, t. 9402; May 1935).—A hybrid between *Fatsia japonica* and *Hedera Helix* with something of the habit of Ivy and the foliage of *Fatsia* as judged from the figure. Apparently hardy and easily propagated by cuttings.—F. J. C.

Hosta decorata f. *marginata*. By W. T. Stearn (*Bot. Mag.*, t. 9395; May 1935).—A "Funkia" with a broadly elliptic white margined leaf, long-petioled, and racemes of drooping mauve flowers, hitherto confused with *H. undulata*. Hardy and apparently widely distributed but of unknown nativity.—F. J. C.

Kigelia pinnata (Jacq.) D. C. (*Flow. Pl. S. Afr.*, t. 573; April 1935).—The Sausage tree of the Transvaal. A tree of 30 feet, with unequally pinnate leaves in whorls. Flowers deep brownish-crimson, about 3 inches long and wide, in a pendulous raceme. Name in allusion to the shape of the fruit.—F. J. C.

Leucospermum lineare R. Br. (*Flow. Pl. S. Afr.*, t. 572; April 1935).—A narrow-leaved Proteaceous plant, with flowers in dense heads about 4 inches across, reddish-brown in the mass. A low-growing shrub.—F. J. C.

Lycaste longiscapa E. Cooper. By V. S. Summerhayes (*Bot. Mag.*, t. 9400; May 1935).—Probably native of Colombia. A cool house species with green flowers and a red lip similar in colouring to *L. gigantea* than which the flowers are smaller.—F. J. C.

Oxalis helicoides Salter. (*Flow. Pl. S. Afr.*, t. 579; April 1935).—A new species with a white variety (var. *alba*), not uncommon in Namaqualand. Foliage clustered at top of a wiry spiral stem, of three narrow leaflets, about $\frac{1}{4}$ inch long; flowers deep ruby-red, about an inch across. Bulbous.—F. J. C.

Primula Wollastonii Balf. f. By Sir Wm. W. Smith (*Bot. Mag.*, t. 9401; May 1935).—First collected on the first Mt. Everest expedition, subsequently sent by H.H. the Maharajah of Nepal to H.M. the King among other plants. A species with a rosette of hairy leaves and a scape about 6 inches high bearing two to six pendent campanulate dark purple or blue flowers. May be propagated by root cuttings.—F. J. C.

Pseudogaltonia clavata Kuntz. (*Flow. Pl. S. Afr.*, t. 580; April 1935).—Syn. *Galtonia clavata*, *Pseudogaltonia Pechuelii*, *Lindneria fibrillosa*. From a bulb covered with coarse fibres producing about nine erect leaves about a foot long, and a many-flowered scape with greenish-white tubular flowers about $1\frac{1}{2}$ inch long, arranged in a raceme.—F. J. C.

Rhododendron scopulorum. By J. Hutchinson (*Bot. Mag.*, t. 9399; May 1935).—A tender species of the *Maddenii* group introduced by Kingdon Ward from Eastern Tibet, where it makes a tree 14 or 15 feet high. Flowers white suffused with pink towards the middle of the lobes outside. Flowering at end of March in the Rhododendron House at Kew. Flowers scented of violets.—F. J. C.

Schottia transvaalensis Rolfe. (*Flow. Pl. S. Afr.*, t. 574; April 1935).—A small tree up to 30 feet. Leaves shown as imparipinnate, but described as paripinnate; inflorescence densely many-flowered; flowers bright carmine. Native of Transvaal.—F. J. C.

Swertia perfoliata. By J. S. L. Gilmour (*Bot. Mag.*, t. 9393; May 1935).—An erect perennial herb up to 30 inches high with broad elliptic leaves and a spike of white flowers veined with blue. Not a specially attractive plant but easily grown in a damp place. Native of W. Himalaya.—F. J. C.

Syzygium guineense DC. (*Flow. Pl. S. Afr.*, t. 577; April 1935).—A tree about 20 feet high, from the Transvaal. The stamens are (as in many Myrtaceae) the most conspicuous part of the flowers, which are in cymose panicles.—F. J. C.

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THE FLOWERS OF THE LITTLE KARROO.

By The Hon. Mrs. RYDER.

[Read August 13, 1935 ; Mr. F. C. STERN, F.L.S., in the Chair.]

THE Little Karroo, or Southern Karroo, lies to the east of Cape Town and north of the mountains which divide it from the coastal belt with its luxuriant vegetation and immense flora, the result of a wonderful climate and soft damp mists from the sea.

Heaths, Orchids, Irids, Proteaceous plants of all sorts grow in the coastal belt, Pelargoniums, Everlastings and Daisies, such as *Arctotis* and *Gazanias*—an endless list of most lovely flowers which one would love to grow, but which are not hardy in our climate. I believe, though, there are many we could grow with a little care and more knowledge as to their cultivation, and also, most important of all, by raising them from seed and not attempting wild imported plants. Plants are usually collected hastily in flower and dry out completely in a short time. By raising them from seed most plants come naturally to our flowering season, which is the opposite of that in South Africa.

Thus *Watsonia Beatricis* and its many hybrids flower with me in July and August and in South Africa in January and February.

May I here point out that *Watsonias* are just as hardy as *Montbretias* if not planted out in the open as seedlings (they should be two years old from seed) and if given a damp root run in full sun. Very few species grow in very dry places and most *Watsonias* should do well under the same conditions as *Iris Kaempferi*.

Some *Watsonia* sp. are found in really marshy ground and some in running streams, such as *Watsonia Galpinii*. The late summer species are far the hardiest. *Watsonia Ardernei*, the beautiful white

variety, is the least hardy, though most commonly grown in this country. It blooms so early in June that it is liable to be cut down by May frosts, and also it does not carry its dead leaves in quantity through the winter like many other species do. These dead leaves protect the young growths, and should on no account be cleared away.

These remarks are outside the title of this talk, "The Flowers of the Little Karroo," but may be of interest to some who are not so attracted to the succulent growth of the Karroos, Great and Little. Here the conditions are so different, so arid and dry, that one wonders how any plant survives. It is very hot in summer and very cold in parts in winter, but always with a dry atmosphere and only occasional very heavy rains, mostly thunderstorms.

We could grow most Succulents out of doors if it were not for the damp. Wet kills—not cold.

Once we have left the coastal belt and risen by one of the magnificent but terrifying passes over the mountains that guard the Little Karroo the scene changes entirely. Last November we took the Tradouw Pass, about 14 miles from Swellendam, as our gateway to the Little Karroo (fig. 131).

The rains had been very severe, and the Garcia Pass coming up from Riversdale had been closed owing to washaways on the road, a bridge having been carried away, and all communication on that side was cut off for some time.

The Tradouw is very beautiful all the way up and barren and lonely at the top, though there is one dwelling-house built there.

The road descends easily on the other side to Barrydale, and already we were in the Little Karroo.

At the foot of some rocks we found *Aloe ciliaris*, and further down, just before entering the dorpe, we found a *Gibbaeum* or *Mentocalyx velutina*, the small form growing near slabs of rock but very much nibbled by goats.

Beyond Barrydale there is a rather bleak uninteresting road, steep and twisty in parts for a few miles, and then suddenly we turned a corner and came on to a veritable riot of colour—the Little Karroo in full bloom owing to the heavy rains which had prevented our taking the other route. I had never seen it in flower, and it was an amazing sight.

We looked down on to a tumbled land of hills and kopjes and rocks red in colour as in Devonshire, with here and there a white kopje standing out, and everywhere flowers. Masses of deep purple bushes, like a very glorious Scotch Bell Heather, of *Lampranthus Haworthii* in the distance, and nearer to the road *Mesembryanthemums* in red, yellow, orange, lilac, and pink, and large bushes of pure white, the whole scene framed by the beautiful South African mountains which one never tires of, they are so wonderful and so varied, and yet always a part of the scenery in Cape Province (fig. 132).

Ruschia approximata and *R. impressa* grew there, and the latter made rivers of pink flowers in the mud by the wayside.

Delosperma delicatulum was another lovely Mesembryanthemum.

Once I thought we had really found a sky-blue Mesembryanthemum, but when we got up to it I found it was pale lilac, and the blue effect was caused by the brilliant sun.

Aptosisimum depressum grew in patches of brilliant gentian-blue striking a violent contrast among the Mesembryanthemums. We were really out to find the rarer species of this great family, and they grew chiefly on the patches of white stones, sometimes covering several acres and sometimes only quite small areas.

Gibbaeum pubescens (fig. 134) grows in very large and numerous patches, and seemed to me to have increased considerably since last I searched for it. With it grew *Euphorbia Susannae*, *Anacampseros papyracea* and the woody-rooted *Pelargonium carnosum*, with small flowers and fern-like leaves.

The most interesting road leads to Riversdale from Barrydale, and here we found much *Gibbaeum molle* growing in yellow gravel and hard to find, as its little apple-like growths seem to imitate the little stones it grows among, either red, green, brown or yellow. Once in a dry season, when we had been hunting for them for some time and finally subsided exhausted to eat our lunch, we discovered hundreds all round us embedded in the gravel.

With them grew *Crassula columnaris*, the bun Crassula, as we called it, with very pretty white, sweet-smelling flowers. It is hard to keep going at home, being a biennial.

Some way on nearer Riversdale we came to a range of kopjes covered with white stones, glaring white, and here we found *Gibbaeum album* (fig. 135) with both white and pink flowers. It is a lovely *Gibbaeum*, though quite hard to see among the stones. Above it beautiful pinky-grey clumps of *Argemone petrensis* (fig. 135) with deep pink flowers caught our eyes. Surely this is the neatest and prettiest of all Mesembryanthemums in the wild. It is so tight and close in its compact growth. At home it gets rather loose and straggly, but it is most symmetrical in its wild state.

The large *Gibbaeum velutinum*, also called *Mentocalyx Muirii*, grew near the *Gibbaeum album*. It was in good growth and very handsome and velvety.

A little way on we stepped out of the car to find masses of the famous *Muiria Hortenseae* by the roadside, and almost on the road itself. There was plenty of it, and it seemed to me to have increased, as *Gibbaeum pubescens* had done, since I last saw it. It was not in flower and the seed was not ripe, which was disappointing.

I looked with great care for the hybrid between it and *Gibbaeum album* which occurs occasionally where the two colonies of plants are close together. I had seen this hybrid in Dr. LÜCKHOFF's garden and also in the Stellenbosch University Gardens. After a most intensive search I found one only.

Muiria Hortenseae grew like little Potatoes stuck up on end in circles of five or six, and sometimes the plants were packed together in quite

dense masses, but always among fairly large white stones. The two leaves are so welded together that there is no dividing line, and the flowers have literally to burst through the little pale green velvet lump which is the plant. It does not keep its character in cultivation, as it is apt to get swollen and deformed and rarely flowers.

Not far from the Muiria we saw flowers of *Cotyledon cacalioides*, bright buttercup-yellow, and very beautiful among the surrounding greys.

Another interesting drive is from Riversdale over the Garcia Pass through Adam's Kraal to Van Wycksdorp, and round under the shadow of the mountains back to Riversdale through the same Pass.

We found the woolly *Cotyledon heterophylla*, which is rare, on this road; also *Trichocaulon piliferum*, locally called Garp.

Aloe variegata, so like a partridge's wing, is found in plenty in this locality.

There is a wonderful spot where *Gibbaeum pubescens* grows magnificently in huge cushions of white-velvet fingers, so soft and downy.

Euphorbia multiceps, in cone-shaped masses of little growths, one above the other till a real little pyramid is formed, grew near it.

Rimaria Heathii is often met with, but always catches the eye as it is so smooth and round, and such a lovely pale grey-green in colour. The major form grows near Van Wycksdorp, but we did not find it there, though we did see it later nearer Ladismith.

Gibbaeum geminum grew very freely, large straggling, creeping plants like a small *Gibbaeum pubescens*, but not such a lovely colour or of such neat growth.

After Van Wycksdorp we stopped to hunt for *Gibbaeum dispar*, 'G. despair,' as Mrs. Ferguson of Riversdale called it, as it is so hard to find. We found a few in slaty terraces near the dorp, and then went on and found a very good new place in similar slaty rock. It grows in the cracks of the stone as do many Conophytums. *Conophytum Muirii*, one of the smallest species, is plentiful on the Little Karroo.

Soon after this we left the road and struck across some flat, uninteresting sheep farms, where *Gibbaeum pachypodium* and *G. angulipes* grew in plenty, but we thought them uninteresting and did not collect many, but unfortunately now *G. pachypodium* is much sought after.

We made our way to Calitzdorp via Ladismith, and before running down the Huis River Pass collected *Aloe Muirii* on an ostrich farm belonging to an old Dutch farmer.

The Huis River Pass is short but very steep; the river-bed full of pink Oleander in full bloom was very pretty. Above, the *Portulacaria* clouded the rocks with its soft, mist-like flowers, pinky-mauve in colour—a lovely succulent shrub and good for the cattle to eat in droughty seasons.

At Calitzdorp (fig. 139) we found Mr. BLACKBURN, the station-master, most kind and helpful. He gave us most detailed instructions as to finding *Haworthia Maughanii*, and we sallied forth next morning in terrific heat and after much arduous hunting we succeeded in finding it.



FIG. 131 ON THE WAY UP THE TRADOUW PASS
(p. 430)

To face p. 432



FIG. 132. TARGE 1750. MUSEUM OF ANTHROPOLOGY, LITTLE KARPOG.



FIG 133 GIBBAUM MURCI



FIG. 134. *GIBBAEUM PUBESCENS* ON LITTLE KARROO
(p. 431.)

On a Saturday afternoon Mr. BLACKBURN took us to a wonderful area right away from the beaten track to find *Haworthia truncata* (fig. 142), the large form. It was a hard test for our poor old Hillman and the roughest road we had been on, but it was well worth it.

In one place *Rimarias* grew of every size and shape and colour; they are really just like lovely clouded opals when burnt by the sun, and I only wish we could keep their wonderful colouring in cultivation.

Rhigozum obovatum, a Karroid shrub with beautiful clear yellow flowers, was in full bloom.

At last the road got too bad, and we had to abandon the car and walk a mile and a half up a dry river-bed, with here and there huge clumps of *Trichocaulon flavum* and a very large-leaved *Glottiphyllum*, till we reached a large amphitheatre all rocks and stones surrounded by hills very arid and dry-looking. Coppery masses of *Haworthia viscosa* grew among the larger stones.

Sunk deep in the ground and covered with smaller stones we found literally thousands of the large *Haworthia truncata* growing in large groups. Three species of *Anacampteros* grew there, also *Rimaria Blackburnii*, called after our kind guide who discovered it.

On the way back to the car *Heurnia Pillansii* and *Crassula barbata* were added to an already very heavy bag.

THE MAY FROSTS AT WISLEY.

By B. O. MULLIGAN.

As the late frosts of mid-May, 1935, are likely to become historical to gardeners and a standard whereby future visitations of a similar kind may be judged, it is well that the facts in different localities should be recorded. At Wisley the following figures were obtained at a point 120 feet above sea-level, all being in degrees Fahrenheit.

	<i>Min. temperature on the grass.</i>	<i>Min. temperature in the screen. (4½ feet above the ground).</i>
May 13	22°	35°
„ 14	23°	34°
„ 15	30°	37°
„ 16	28°	38°
„ 17	18°	27°
„ 18	19°	32°
„ 19	20°	31°

That is to say, that for seven consecutive nights between two and fourteen degrees of frost occurred on the ground, and for the last three of those nights freezing point was also reached in the screen. Furthermore, taking the twelve dates from May 10 to 21 inclusive, only three nights were free from frost on the grass, and there is every reason to believe that those figures given above would be even lower if they had been recorded in the Wild Garden, Howard's Field, or the Commercial Fruit Trial grounds, all of which are much closer to the river and at a lower altitude.

As has already been stated (R.H.S. JOURNAL, 50, p. cv.) the screen minimum of 5° of frost is actually the lowest recorded at Wisley in May since observations were begun in 1904. The minimum on the grass—14°—has been lower in May on two occasions, 1927 and 1929, but these low temperatures were recorded on May 1 in each of those years. This figure was also reached on May 9, 1928, and it is interesting to compare the three years 1928, 1929, and 1935 in this respect, considering only the first twenty-one days of May.

<i>Nights with frost.</i>	<i>Consecutive nights of frost.</i>	<i>Nights free from frost.</i>
May 1928 11	6 to 10, 19 to 21	10
„ 1929 14	1 to 4, 9 to 11 16 and 17	7
„ 1935 10	13 to 19	11

Thus this year actually had fewer nights below freezing point on the grass than either of the two comparative years, but more nights in

succession than either of them and this may be one of the factors to which so much resultant damage can be ascribed, and another is the aggregate length of time during which the temperature remained below freezing point—nearly double that of either of the former years.

Two other points of possible value also emerge from graphs made to compare the weather features of these three years. One is that in 1935 the maximum screen temperatures recorded were generally fairly high in the earlier half of the month of May, rising to a peak of 76° F. on May 6, and again to 68° F. on May 11. In May, 1928, a rather similar state occurred, the temperatures being highest in the first week of the month, but in 1929, excepting one point of 67° F. on May 10, the figures remained low until after May 20.

The other feature to note is the rainfall. The totals from April 1 to May 19 inclusive, a period of seven weeks, are as follows :

1928	4.24 inches
1929	2.19 ..
1935	3.45 ..

In addition the fall for the eight days from May 13 to 20, 1935, may be given :

May 13	0.07 inches
.. 14	0.15 ..
.. 15	0.02 ..
.. 16	—
.. 17	—
.. 18	—
.. 19	0.34 ..
.. 20	0.25 ..

In 1928 two inches of rain fell in the first three weeks of April, and another two inches between May 12 and 19. In 1929 the bulk (1.75 inches) fell in May. In 1935, 2.18 inches were registered in April, and 0.6 inches between May 12 and 19. Here again, therefore, there is resemblance in rainfall as well as in maximum temperature between the same periods of 1928 and 1935. Unfortunately there is no record of the amount of damage caused by frost in the former year, but in 1935 it might be conjectured that ample rain in April, followed by high temperatures in May, caused an abundant growth which was more easily damaged by the subsequent low temperatures. It should however be noted that the fortnight from April 28 to May 12 was, in 1935, extremely dry, only 0.03 inches of rain falling at Wisley.

The damage done to vegetation within the Gardens will now be stated in more detail. This must not be considered as an exhaustive catalogue of either damaged or unharmed plants, the writer fully realizing that this is not the case and having only made mention of the more noticeable examples in as many different types and genera as possible.

FRUIT.

In the Commercial Fruit Trial grounds, 50 feet lower than the previous altitude mentioned and close to the river, all prospects of tree fruits were completely swept away. Well set Plums and Pears became discoloured within a few days and later dropped off the branches. In July there was not a Plum in the whole orchard, and the only Pears a few poor specimens resulting from flowers formed on the current year's growth. Among Apples the late-flowering 'Crawley Beauty' alone escaped, not having commenced to flower at the time of the frosts, and on this variety there are a few fruits but nothing approaching a crop. 'Edward VII' blooms late, but before 'Crawley Beauty,' and has no fruit. Flowers and some fruits were produced later from secondary growth on the following varieties, but all were badly damaged by a hail-storm in June: 'James Grieve,' 'Lord Lambourne,' 'Ellison's Orange,' 'King of the Pippins.' The two chief varieties of commercial value, 'Bramley's Seedling' and 'Cox's Orange Pippin' are fruitless.

Of bush fruits, Red and Black Currants held about one quarter of their normal crop, the former rather more than the latter, but in none was a full bunch of berries formed and scattered strigs carrying three or four fruits were the rule. These were principally to be found in the centre or lower parts of the bush where more protection was given by the foliage, and in this respect the varieties of the French group of Black Currants were better than others. Picking of green Gooseberries had already begun before this period, but all younger fruits subsequently turned brown and dropped, thereby losing at least 25 per cent. of the crop.

Raspberries were much later than usual, picking not having commenced by July 8, and the yield will be far below the average.

Strawberries lost their first flowers and therefore the earliest fruits, but the remaining buds developed well, thanks largely to the heavy rains in June, and produced about three-quarters of a normal season's crop. 'Royal Sovereign' bore the lightest, 'Western Queen' and 'Tardive de Leopold' the heaviest weight of berries. This is probably correlated with the denseness of foliage in the respective varieties giving less or more protection to the flowers.

Many of the Blackberries had a foot or more of young growth cut back by the frost, and the earliest sprays of flowers thereby destroyed, but 'John Innes' and 'Himalayan Giant' at least are carrying light crops from the later flower trusses.

In the nursery many grafted Pears which had just started into growth were killed, stock and scion being insufficiently united.

In the Gardens proper different types of plants—herbaceous, trees, and shrubs—will be dealt with in succession, mentioning both those which were damaged in greater or less degree as well as others which escaped unharmed. Some in the latter class may be as unexpected as others in the former.



FIG. 1355. GIBBAEUM ALBUM BELOW, ARGENTAE PLURIENSIS ABOVE
(p. 431.)

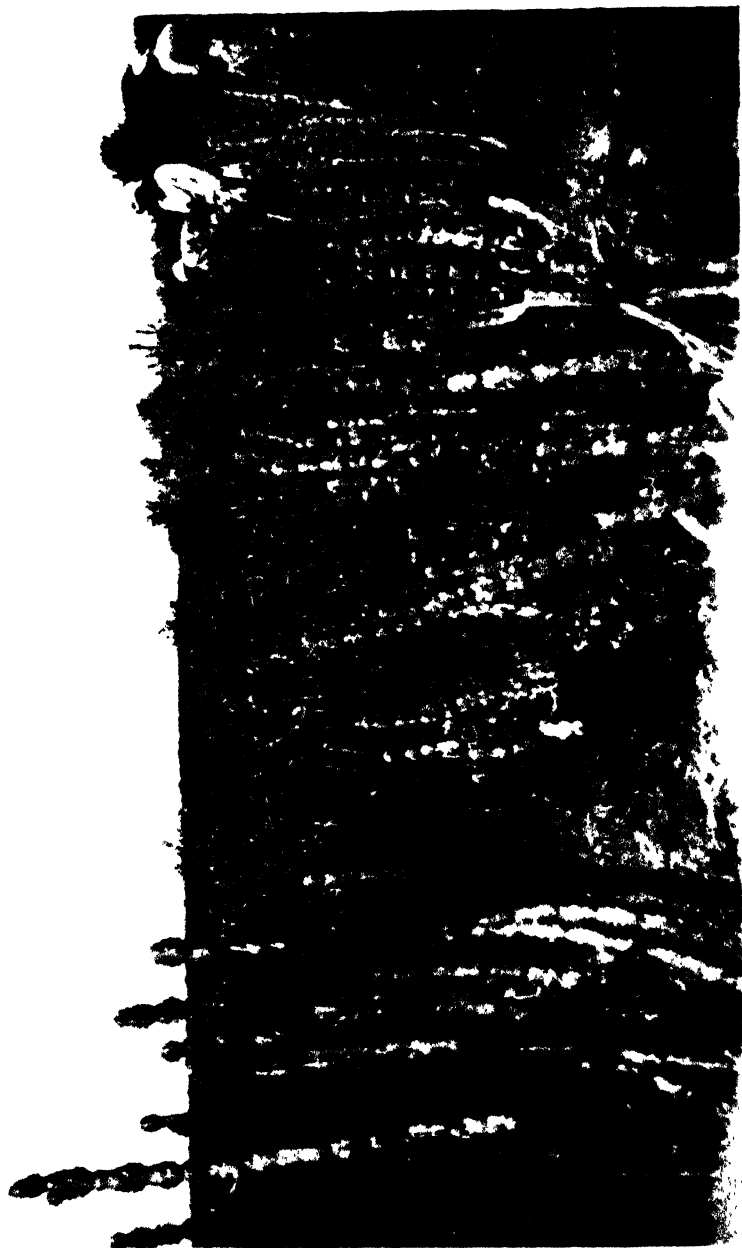


FIG. 136 - SEARCHING FOR HAWAIIAN ON THE LITTLE KARROO



Fig. 137 - KARROO PLAINS, WHITE HUT



FIG. 138 — PUCO'S VALLE, WHITE KARROO

To face p. 437

HERBACEOUS PLANTS.

In the herbaceous border, which lies in an open position, but surrounded by a young yew hedge, some plants were noticeably susceptible—*Astilbes*, *Eupatoriums*, *Bocconia cordata*, *Artemisia lactiflora*, *Clematis heracleifolia*, while seedlings of such annuals as *Salpiglossis*, *Ursinia*, *Bartonia*, and *Phlox Drummondii* were unharmed. *Dimorphotheca Ecklonis* was just marked on the leaf tips. In a thin pine wood near the river Bracken tops were destroyed and Bluebell flowers remained untouched.

Of Lilies, *L. regale* suffered worse than any other species, practically every plant in the Gardens being doubled up and losing the top half or more of the stem, while young bulbs had their growth cut back to ground level. *L. Henryi* was browned at the tips in some places only, as was *L. Willmottiae* in one place in the Wild Garden. On *L. Sargentiae* the growing points were apparently undamaged but the lower leaves were badly discoloured. *L. giganteum*, with prominent stems about 3 feet high, had only a few older leaves bronzed here and there, although the foliage of two-year-old bulbs in nursery beds at a higher altitude and more exposed was rather severely injured. Such Lilies as *L. superbum*, *L. pardalinum*, *L. rubellum*, *L. Szovitsianum*, and the varieties of *L. × elegans* suffered not at all; but of certain others the closely-wrapped flower buds were either distorted or wholly destroyed. The allied *Nomocharis* had some leaves browned in the nursery beds, but were practically untouched in the Wild Garden.

Of *Primulas* the foliage of young plants of *Primula chungensis* was damaged in an open position, but older plants in the Wild Garden came through safely. Many flowering stems of *P. pulverulenta* and its hybrids were here bent over and spoiled, although some recovered later. *P. japonica* and *P. helodoxa* were unhurt, although growing in the same ground.

No *Meconopsis* was touched, although *Meconopsis regia*, *M. superba*, and *M. betonicifolia* were in bud.

The unfolding leaves of *Gunnera manicata* by the Long Pond were of course blackened, while the tops of *Osmunda regalis*, growing nearby, and some leaves of the yellow bog Arum, *Lysichiton americanum*, were damaged.

On the whole herbaceous plants did not suffer severely, and later growth in most cases has replaced the first losses without unduly taxing the plants. The loss of flowers of *Lilium regale* is a most regrettable feature, but the bulbs are not likely to be in any way affected.

TREES.

By far the most serious damage was done to Trees and Shrubs, to individuals of all sizes and ages, from those in nursery rows to fine old trees of 50 or 60 feet, in situations varying from the open hillside facing north to the sheltered low-lying Wild Garden. Of British Trees many

Oaks had their green young leaves turned completely brown in a single night, the damage being sometimes confined to the lower branches only, but more often the entire tree was thus crippled. Wherever they had commenced growth the young shoots of the common Ash were uniformly turned to a blackened mass, but Elms were undamaged, probably because the leaves had had time to become firm. Of the Beech, Sycamore and Black Poplar it can be recorded that the first two had their young leaves browned and shrivelled, but were not seriously hurt, and that the last was untouched.

There is, however, a very different tale to be told amongst introduced species. Some of those which lost the whole or greater part of their new growth and foliage, as well as any chance of flower and seed production, were the Sweet Chestnut (*Castanea sativa*), False Acacia (*Robinia pseudacacia*), Tulip tree (*Liriodendron tulipifera*), Magnolia *acuminata*, the N. American Red Oaks *Quercus coccinea* and *Q. rubra*, *Juglans Sieboldiana*, Davidia, Cercis, Phellodendron, *Aesculus Hippocastanum* and *A. parviflora*, Oxydendron, Cercidiphyllum, Ginkgo and *Betula utilis*. Those Conifers most affected and which had their young shoots cut back were species of Picea, Abies and Tsuga, *Sequoia sempervirens* and some Cedars. Apart from these, dwellers in the Pinetum were not amongst the worst casualties.

Damaged young Trees and Shrubs in the nursery beds have naturally suffered to an even more severe extent, since they have not the reserves of a mature tree on which to draw.

Amongst species in the Gardens which entirely escaped were *Luburnum* \times *Vossii* (in bud), and the young shoots on Pyrus, Malus, Sorbus, and most Prunus species, including the Japanese Cherries, but excepting *P. Grayana*, of which a 10-foot tree lost every leaf and flower bud.

SHRUBS.

Because of their far greater number and variety, the list of Shrubs is more serious and imposing. The larger part of these are growing near river level and therefore probably endured even worse conditions than those few on the hillside where the frost records were taken. One of the genera most damaged was Magnolia, where among twelve species and hybrids only *M. Kobus* escaped unscathed, and practically all the others lost every leaf and incipient flower. Many species and hybrids of Rhododendron came into the same unfortunate category, losing all their young growth, including *R. Wardii*, *R. moupinense*, *R. Williamianum*, *R. heliolepis*, *R. decorum*, *R. irroratum*, *R. Loderi*, *R. Augustinii*, *R. trichocladum*, *R. rubiginosum* and *R. niphargum*, to mention a few from various series. Azaleas had all flower trusses destroyed, but generally the growing shoots were not seriously damaged, excepting *R. Schlippenbachii* and one or two allied species. All the promising buds on the Wistarias were reduced to brown stringy masses, ruining in a single night one of the loveliest sights the Gardens can show in late May.

Of *Pieris*, *P. japonica*, *P. formosa* and *P. Forrestii* were cut back, but *P. taiwanensis* had not yet started into new growth and so escaped. All species of *Corylopsis* were completely browned, as were many *Philadelphus*, *Diervilla* and *Deutzia* species and hybrids, *Stachyurus chinensis* and *S. praecox*, *Enkianthus perulatus* (*japonicus*) in one site only, *Acer palmatum* in several forms, *Decaisnea Fargesii*, *Salix magnifica*, *Hydrangea Sargentii* in the Wild Garden (this incidentally was clothed in fresh foliage a month later), and *H. petiolaris* in the open, *Dipelta yunnanensis* (but not *D. floribunda* close by), *Syringa Emodi*, *S. Sargentiana*, and *S. Palibiniana*, *Callicarpa* and *Styrax* species, *Illicium anisatum* in the open but not in shelter in the Wild Garden, and so on. Most of these enumerated thus far were seriously crippled, and will require one or more years to recover the stage to which they had attained before the advent of these abnormal frosts.

Other Shrubs suffered from having the tips of their young growths killed, but although losing that wood and being rendered unsightly for a while, it is damage which is more easily recovered than the previous class of devastating defoliation. I have included among the latter category those *Rhododendrons* which were worst affected, for although young growing shoots and not last year's foliage were destroyed, subsequent splitting of the wood became evident in addition.

TIPS OF SHOOTS CUT OR SHRUBS OTHERWISE DAMAGED.

Buddleia Davidi and *B. stenostachya* (*B. Forrestii* and *B. Fallowiana* were more hardly hit and many leaves partially or wholly withered), *Escallonia macrantha* (the hybrids *E. × Iveyi* and *E. × exoniensis* were unhurt under similar open conditions); the many *Lilacs* in flower were only lightly browned in most instances, but rather surprisingly a number of *Berberis* must be included in this category—*B. replicata*, *B. Jamesiana*, *B. pruinosa*, *B. chitria*, *B. Julianae*, *B. Sargentiana*, and *B. Bergmanniae*, and *B. Ferdinandi-Coburgii* even more definitely so. It will be noted that these are almost all evergreen Chinese species. Common Ivy (*Hedera Helix*), *Daphniphyllum*, *Lonicera nitida*, varieties of *Camellia japonica*, *Eucryphia × Nymansay*, *Viburnum betulifolium* and *V. tomentosum Mariesii*, *Rhus Cotinus purpurea*, and *R. cotinoides*, *Osmanthus Forrestii* and *O. ilicifolius*, *Hamamelis mollis*, and *H. japonica arborea*, *Aegle sepiaria*, *Azara microphylla*, and *Plagianthus Lyallii* are examples of this type of damage. *Leptospermum scoparium* in the open ground had its tops cut back about a foot, but flowered on the lower portion in mid-June.

On the other hand the following can be recorded as having escaped damage, although growing under similar conditions to some of the preceding. *Photinia serrulata*, *Eucryphia pinnatifolia*, *Grevillea rosmarinifolia*, *Cytisus Battandieri*, *Cassinia fulvida*, *Viburnum × Burkwodii* and *V. rhytidophyllum*, *Daphne Blagayana*, *Olearia Gunniana*, *Ozothamnus purpurascens*, *Solanum crispum*, *Vaccinium Mortinia*, *Cornus florida*, *Fabiana imbricata*, *Eucalyptus coccifera*, *Abutilon viti-*

folium and *Ribes speciosum*. No one of these had wall protection, and several were in bud or flower, or had several inches of young growth already made.

The Shrubs on the wall of the Laboratory deserve to be considered separately. On the south-west side *Actinidia kolomikta* and *A. chinensis*, *Clerodendron foetidum*, and *Fuchsia excorticata* were noticeably browned in foliage; the tips of *Clematis Armandii*, and of *Campsis chinensis*, where on the top of the wall, were destroyed. The Pomegranate had some shoots blackened, and others immediately adjoining untouched; this plant is not tied in closely to the wall.

Unharméd were *Eccremocarpus scaber*, though with very soft growths, *Carpenteria californica*, *Abelia Schumannii*, *Jasminum primulinum*, *Acacia dealbata*, *Escallonia montevidensis*, *Drimys Winteri*, etc. On the opposite north-east side only *Desfontainea spinosa* had its young wood cut, while *Melicytus ramiflorus*, *Escallonia* C. F. Ball, *Ceratostigma Griffithii*, *Eriobotrya*, and other plants were passed over.

Reading through these lists of Shrubs one gains the impression that perhaps natives of New Zealand and the southern hemisphere are hardier under Wisley conditions than we imagine, and those from W. China more liable to damage by spring frosts. As to the factors which cause such discrimination in the choice of neighbouring plants and even branches being frosted or not, I leave it to others to determine, but they must, in some instances at least (e.g. the Pomegranate on the Laboratory wall), be complex and deep-seated. No doubt site (including shelter and aspect), soil and plant moisture content, state of growth, presence or absence of essential elements in the soil and plant, and many other interacting influences all have their say in the matter, and even if we knew all, we might yet be unable to fulfil the essential conditions and prevent such havoc amongst our plants in the future.



Fig. 149. - CAUTZDORF, LAHLE, KARROO
(p. 432)



Fig. 46. *Boothia* sp. - Wynn-Hay



FIG. 141. SWATH FLOWLING, MISSISSIPPIAN LUMINOUS AT BARRYDALE, ILLINOIS, KUROO.



FIG. 142. *HAWORTHIA TRUNCATA* AT CAITZBORG.

(p. 433)

GARDENING ON THE HILLSIDE.

A TALK BROADCAST BY LORD ABERCONWAY.

A GARDEN on the hillside should have two great advantages over a garden on the level—the æsthetic one of a view, and the practical one of good drainage.

If I were choosing a site for a garden, nothing would be more important in my eyes than a fine view. Of course, the best of all views is one of high mountains or of the sea, because these views change from day to day or even from hour to hour as the sun moves round and clouds come and go ; but the view over a wide valley may be good, and even one over a small depression or little dell is a help if only the background be picturesque.

The great Italian garden makers of the middle ages attached much importance to views ; and as Italy is a hilly country they easily attained their object.

The famous garden of Isola Bella is a tiny island on a huge lake with the Alps towering above it. Near Florence, the old gardens on the hillside look over a wide valley with the towers of the great city in the distance. In Spain, too, the Alhambra gardens look out from a hillside over plain and city for countless miles.

Of modern gardens, there lingers in my mind the view of the sunlit blue Mediterranean sea from La Mortola, the wonderful garden formed by Sir THOMAS HANBURY on a rocky cape ; and again the view from Rostrevor garden in northern Ireland over an arm of the sea to great mountains beyond ; and again views from more than one Surrey garden on the Horsham ridge over the Sussex Weald to the distant South Downs. In the garden that I know best one looks across the fertile Conway valley with its broad tidal river to the Snowdon range beyond -- often snow-covered--always varying in its cloud and light effects.

Man has done much in all these gardens, but nothing man has done has added as much beauty as the view has given. The moral of all this is that when one has the chance one should start the garden where one has the view—a big view if at all possible— if not, then at any rate a little one. Most roses have their thorns, and of course if you have a view you cannot keep out the wind ; therefore choose your view if possible to the south or to the west, and the warm moist wind from that quarter will do your plants comparatively little harm.

Now having got one's hillside garden with its view— how should we develop it.

In the middle ages, the Italian gardener did it with terraces—huge wrought stone walls with gushing fountains and great stairways with descent after descent towards the valley and the view, and there is no more noble way of laying out a garden.

On a somewhat smaller scale, and I think the better for it, are certain old English terraced gardens—such as that of Powis Castle in Shropshire with its Queen Anne Orangery supporting one terrace, the quaint lead figures, and the great red castle dominating the whole, with views of magnificent park and vale and timber.

Or again, to take other English examples, there is Haddon Hall in Derbyshire, with terraces earlier in date and more simple than at Powis Castle, or Balcaskie in Fifeshire, a very complete and fine lay-out with walls supported by great buttresses and cunningly contrived stairways, looking south across the Firth of Forth.

Such terraced gardens are not only very beautiful, but they give great straight level walks—easy for the oldest or the youngest walker ; walks that have an uninterrupted view not only of the distant landscape but of the garden immediately below.

Curiously enough one can walk to and fro along a straight path absorbed in thought or in conversation, but very few people would feel inclined to pace up and down a winding path—and walking to and fro is one of the things a garden should be made for.

But when one has done walking up and down and admiring the view, one wants to see plants and flowers, for though in the old days, in some of the gardens at any rate that I have mentioned, there was but little beyond the trees that formed part of the garden design—the essence of a modern garden is that it shall grow plants and flowers.

Fortunately terraced gardens provide the best of all opportunities of growing good plants and of growing them well, even in spite of the wind that comes with the view.

A wall, of course, absorbs heat all day and gives it out again at night—after sunset on a hot day one can feel on one's cheek the heat radiating from a high wall even while walking some yards away from it.

This heat helps a tender plant against frost and it helps to ripen the growths of a plant that comes from a sunnier land than ours—and ripened growths mean more abundant flower. Thus against a terrace wall one can grow well a host of plants that would only struggle along in the open bed—the difference in the growth is often surprising.

If the wall has a flower border at the base—and nothing is better—then the flowers are again helped by the extra heat and shelter. Even the wind cannot blow through a plant in quite the same way if a wall is behind it, and if the wall faces south or west, the north and east winds are powerless to do harm.

There is just one other point, too, about a retaining wall—the foot of it is never very dry and may be ten feet below the surface of the ground, and so far down there is always some moisture for thirsty plants.

I have spoken perhaps too long of the great terrace and the mortared wall, for few to-day can build such gardens as were built in the middle ages. The hillside garden can be a more simple and more homely and less costly affair. But you cannot, I think, deal to the very best

advantage with a slope without terracing of some kind—however primitive the method may be.

Soil on a slope is often poor and almost always dry. You can, of course, grow certain plants like the brooms and heathers that will stand drought, just planted on a natural slope, and very lovely they are—but then you are greatly limited in the choice of plants; and especially so if the slope is too steep for a properly trenched bed to be made; so terrace your slope if you possibly can.

Fortunately in hilly country stone is usually cheap and handy, and a series of low retaining walls built without mortar, though perhaps they lack the dignity of the high and formal terrace wall, are a most admirable foundation for growing the smaller plants.

Miss GERTRUDE JEKYLL, gardening in a hilly sandstone country, did more than anyone by her example and by her writing to popularize this way of gardening.

Such walls built without mortar, dry walls as they are called, give not only the extra heat but, if you put plants actually in the wall or at the top of the wall, you get what I said at the beginning was one of the advantages of a wall garden, the best possible drainage.

Stagnant water at the root has killed, I believe, more plants in English gardens than all plant diseases and insect pests combined.

Now a plant growing at the top of a dry wall cannot suffer from stagnant water at the root and a plant planted between the stones of a dry wall can get neither stagnant water at the root nor in the crown.

When, therefore, I fail to grow a plant elsewhere, I try it in the wall, and it is wonderful what a difference it makes—a chink in the wall is better even than a moraine for many a difficult plant.

Of course, such a wall can vary much in form; it can be of stone or brick; it can be straight or curved; it can be high or low, and it can be vertical or sloping. But it should have good soil put in behind it and between the stones, and if the stones are small, some cement or mortar used in the first few courses below the ground level is a help to keep it steady.

Most alpine plants do well in such a wall—the sun-lovers to the south or west, and the shade-lovers, like *Nomocharis*, to the north. I have found some of the more difficult *Primulas*, like the lovely *Primula Winterei* and *P. Forrestii*, respond well to such treatment.

If one has a low dry wall planted in this fashion, one cannot, of course, plant strong growing plants at the foot of it, but many small things and bulbs like the extra warmth and shelter of a wall foot and can be planted there successfully.

Again, in dealing with one's slope, one can get away from the wall idea and have irregular outcrops of rock—a rock-garden in fact—though this, of course, needs larger stones and more skill and may therefore be more costly and more difficult; but the principle is much the same—the slope is broken up into little terraces with good drainage and vertical stone faces to catch the heat.

The outcrops of stone hold up the soil and enable one to get flattish beds from which the rain does not run off, but which are admirably drained, as the ground falls away below them ; and the chinks between the stones again form excellent planting places.

Thus, although a hillside garden requires more labour and more cost to fashion it at the outset, the reward should be there, and should be a most ample one—both in the well-being of one's plants and above all in an ever-changing view.

COLORADO ALPINES.

By STUART BOOTHMAN.

AMONGST growers of alpine plants in this country there is an increasing demand for those from the United States of America, and in particular from high altitudes in the Rocky Mountains. The central and northern parts of this range of mountains have been well explored, but at the southern end and throughout the State of Colorado there is a wealth of choice species unknown to most English gardens. Near the middle of the State is the town of Colorado Springs and behind it lies Pike's Peak. This is a mountain of some 14,216 feet in altitude and the alpine plants from over the 10,000 ft. line are hardy in all parts of this country. On the lower levels the land becomes semi-desert, and although they are subject to and safely withstand severe frosts the plants from that district need dryish conditions. A typical example of this type is *Lewisia rediviva*, which stands all the winter cold, but may perish during a wet summer unless a small piece of glass is laid over the soil to permit thorough drying and baking. In this region also are the *Calochorti*, and *Calochortus Gunnisonii*, with its beautiful white and lilac-blue cups, does well in dry summers out of doors.

As the ground rises in this part of the Rockies the sand remains, but cooler atmospheric conditions prevail and produce a different flora. Plants from here revel in dry sandy soils on gritty banks and scree facing south and in the eye of the sun. *Oenothera caespitosa*, which is also known as *O. marginata* and *O. eximia*, in such a spot produces a long succession of white flowers as much as 3 inches across which change to pink as they fade. In the evening their fragrance can be detected many yards away. Once established it will send out runners all round and in a couple of years there will be a large patch around the parent plant carrying as many as fifty of these huge fragrant blossoms among the red and green foliage. Wherever this *Oenothera* does well there should be planted the *Townsendias*. There are four or five species in cultivation, but, to my mind, the best two are *T. grandiflora* and *T. exscapa*. The former makes a woody stem of an inch or so in height carrying tufts of ashy grey foliage, and from the hearts of the leaf rosettes there appear enormous flowers of a pale shell pink. *T. exscapa* is of similar habit, with equally silver-grey but less hairy foliage, and its flowers are like large white cornflowers. A particularly charming habit of these plants is their way of making the flower buds in the leaf rosettes in the autumn, so that, even in winter, they show their promise of bloom.

Two novelties from this part of Colorado which I tried last year with success were *Melampodium cinereum* and *Asclepias pumila*. Their descriptions in the floras seemed good and seeds of both were

obtained. All the *Asclepias* are lovely, but hitherto have been either too tender or too tall for the rock garden. In *A. pumila* I found one of dwarf stature and have proved its hardiness. Instead of having broad lanceolate leaves it has very narrow foliage like that of a Flax, and this clothes the 6-inch stems which terminate in heads of a dozen or so white flowers. The *Melampodium*, too, has white flowers, but makes a humped carpet of grey-green leaves and produces flowers like miniature *Chrysanthemums* throughout the whole summer.

Above the deserts and sandy plains are the alpine meadows where the *Columbines* grow. Here are waving sheaves of the State Flower of Colorado, *Aquilegia caerulea*, which has entered so largely into the hybridization which produced the long-spurred *Columbines* of the herbaceous border. Betwixt the pines and the snow-capped peaks come the true alpine plants, and many are gems that ought to have been in cultivation long ago. That so brilliant an alpine as *Boykinia Jamesii* (fig. 143) has been known to grow on Pike's Peak for years without collection and introduction into American and English gardens is almost a scandal. However, it is with us now, and all who saw it at the Alpine Garden Society's Show at Birmingham this spring were delighted with its sturdy flower spike, the size of its flowers and their profusion. It grows about 6 inches high and the blooms are fully an inch across, being of a clear pure carmine-red deepening in the centre to velvety crimson, where the ring of yellow stamens serves to intensify the depth of colour. It is hardy and easy to grow, and delights in a cool, well-drained loam.

By the side of the mountain streams grows *Trollius albiflorus*, a very pretty Globe Flower of low stature with large flowers which open creamy, but quickly change to pure glistening white. They are quite freely produced and last for a fortnight or three weeks. *Pentstemons*, of course, abound in the chain of Rocky Mountains and one becomes shy of introducing any that do not carry a testimonial. However, in *P. Crandallii* I have found a most desirable addition. It is shrubby, like *P. Davidsonii* (*P. rupicola*) but has narrow grey leaves flushed with pink, reddish-brown stems and erect flowers of a lovely turquoise blue. On the other hand, *Chionophila Jamesii*, described as a white-flowered *Pentstemon*-like plant of lowly habit, was, to my mind, rather dowdy.

One is accustomed to regard the silvery *Kabschia Saxifrages* as the smallest of their tribe, but I think that *Saxifraga chrysantha*, of a totally different section, is as small as the neatest and tightest of *Kabschias*. I have not seen it rise more than half an inch from the ground level and it makes a wee carpet of bright glossy green leaf rosettes each just a quarter of an inch in diameter. From the middle of every rosette comes one small butter-yellow flower, but as there are hundreds of rosettes the effect is that of a bright yellow carpet. Another Colorado Saxifrage being tried is *S. nivalis*, which, so far, has made attractive rosettes of reddish-green leaves, but has not yet produced the small white flowers which it is reputed to bear.

No description of *Gentiana Romanzowii* could be better than that of the collector: "A chic little lady in second mourning." It has white trumpets with a black stripe at each corner, and in habit, choiceness and rarity it is reminiscent of the European *G. Froelichii*. *Mertensia coriacea* turned out to be ever more exquisite than I had expected. From low tufts of silvery foliage it sent up stems to a height of four inches and carried at the top clusters of Cambridge blue flowers, unsullied by any hint of purple or mauve. It needs moraine treatment in the garden and does well on either limestone or granite.

The higher the altitude the more dwarf become the plants, and *Aquilegia saxemontana* is one of the most miniature of Columbines. It has never been shown at any exhibition in this country and is very rare, even in its home. The total height of the leaves, stems, flowers and all is but an inch and a half, but it makes a nice hump several inches across. Its leaves are silver-green with brown centres, whilst the flowers have blue sepals and white petals. What appeared to be a tennis ball lying on the moraine one morning turned out to be *Phlox condensata*. This very slow-growing species, instead of forming mats of prostrate shoots, humps itself up into a ball and becomes one mass of white flowers in late May.

On the highest parts of Pike's Peak at an elevation of between 13,000 and 14,000 feet grows *Eritrichium argenteum*. It is a glorified *E. nanum*, equally hairy, minute and compact, but much more silvery and with flowers of a heavenly blue. It ought to have been quite impossible to grow, and on this assumption the seeds were sown with a large batch of ordinary odds and ends, put in the frame and watered with a hose fitted with a fine spray. This overhead watering should have been the end of them, but one fine day in the earliest spring one little fluffy pin-head appeared, and others quickly followed until there were a dozen or two. Most of them survived moving into pots, and an attempt to kill one by planting it outside on the scree during hot June weather has, so far, failed, so that one comes to the conclusion that the alps of Colorado are as accommodating as they are beautiful.

NEW VIRUS DISEASES OF THE TOMATO.

By KENNETH M. SMITH, D.Sc., Ph.D.,

Potato Virus Research Station, School of Agriculture, Cambridge.

VIRUS diseases of animals and plants are caused by infectious agents too small to be seen even with the best microscope, because they are below the resolving power of the ordinary lens. Since viruses are so small and often so infectious it will be understood that they are readily spread about by a variety of methods, some of which are not yet properly understood.

At intervals there may appear on a particular crop a virus disease unlike any hitherto described on that plant, and as a rule there is no indication as to where this apparently new virus disease has come from. This year an unusually large number of undescribed virus diseases have appeared, particularly on the Tomato plant, and it is with the new diseases on that host that this short article is concerned.

A few years ago there was recorded the appearance, for the first time in Europe, of the serious Tomato virus disease known as "spotted wilt," and an account of the diseases caused by the virus on different ornamental plants appeared in the July number of this JOURNAL (p. 304).

This year no fewer than three new virus diseases of the Tomato have been identified at Cambridge from material sent in from different parts of the country, and the symptoms of these diseases are here described in order that growers may recognize them and take steps to destroy the affected plants.

Disease number one was first noticed in a commercial glasshouse in Somersetshire, and since then it has been recorded from several other localities, and even from so far afield as Belfast. The chief symptoms of this disease are as follows: there is an almost complete cessation of growth, while in very young sappy Tomato plants a destructive lesion may develop in the stem at and below soil level. Another symptom of the disease is the characteristic yellow and blue coloration of the leaves, and this is also frequently accompanied by the development of concentric rings. The lower part of an affected plant is chlorotic (yellow), and there may be a certain amount of mottling on the upper part. The youngest leaves are usually pale yellow and may be distorted and even completely reversed. Under certain environmental conditions the actual growing points are destroyed, and this leads to the production of a distorted plant of a bushy or "rosetted" habit with malformed shoots and leaves (see fig. 144). The symptoms on the ripe fruits consist of a mottling or blotching of pale spots and ring-like marks on a darker background. The green fruits appear normal though they are very poor in quality.



FIG. 143 BOYKINIA JAMESII
(p. 446.)

(To face p. 448.)



FIG. 144. VIRUS DISEASE OF TOMATO
Showing rosetted and dwarfed growth due to destruction of growing points
(p. 448.)

The main symptoms then of this disease are cessation of growth, yellowing and purpling of the lower leaves, together with distortion and malformation of the whole plant.

The second new disease is due to a virus of a more infectious nature than the foregoing and is in consequence more easily spread by mechanical means. The outstanding characteristic of this second disease is the extreme malformation of the affected plant. The plant, indeed, may be so distorted that it is only with difficulty recognized as a Tomato. The malformations of the leaves are of several quite distinct types. There is, firstly, the complete suppression of the leaf blade or lamina, so that the leaves often consist simply of long thin threads (see figs. 146 and 147). Again, there occur large numbers of very small leaflets, placed close together, forming a curious kind of "fern leaf" and ending in a corkscrew tendril (see fig. 145). The angles, also, of individual leaves may be enormously prolonged, giving such leaves a curious spidery appearance (see fig. 146). Another very curious effect is the production, on the under surfaces of the leaves, of out-growths (enations) or small additional leaves. Added to these abnormalities there is a tendency to overgrowth, so that affected Tomato plants are larger than normal and under commercial conditions of cultivation present an astonishing appearance of leafiness and abnormal extra growth. In the words of a competent observer: "The extravagant growth of the plants, the excess vegetation, the curling, twisting tendrils, large leaves producing shoots from their midribs, the trusses ending in long shoots and waving deformed leaves gave a nightmare appearance."

In addition to this growth stimulation there is usually a certain amount of dark and light green mottling on the leaves.

During a tour of the tobacco-growing districts of South-west France last year, the writer observed this virus to be fairly common on the Tobacco plants in certain areas. On Tobacco also the virus produces extreme malformation, consisting mostly in the reduction of the leaves to thin whip-like structures. This year the disease appeared on Tomatos in some commercial glasshouses in the west of Scotland, where it rapidly spread through the whole of the crop. About the same time specimens of Tomatos similarly diseased were received by Dr. G. C. AINSWORTH at the Cheshunt Experimental Station. From the growers' point of view this disease is a very serious one, the production of fruit on the affected plants being very poor and mainly confined to the lower parts of the plant. Some of the extraordinary malformations of growth induced in Tomatos by this virus are shown in figs. 145-148.

The third disease has so far been reported from three localities, from Ipswich, Felixstowe and Bath. In these places the disease is widespread and serious. The symptoms are mainly of the "mosaic" type, that is a mottling of the leaves, but it is a different kind of mottling from any of the mosaic diseases with which most Tomato growers are familiar. Young affected plants are of an abnormal green colour

with a faint greyish cast, and the leaves are banded with pale yellow and dark green (see figs. 149 and 150). The mottling is more pronounced and differs in character from the mottling of ordinary Tomato mosaic, and there are none of the bright yellow patches characteristic of Tomato "aucuba" or yellow mosaic. Various tests on a range of host plants show this disease to be due to a different virus from those causing the two mosaic diseases mentioned above.

In older plants growing under commercial conditions the chief symptom is the extreme yellowing of the lower parts of the plant. This gives the appearance of a plant suffering from nitrogen starvation, and the opinion had been expressed that this was actually the cause of the trouble. The ripe fruits are mottled with spots of yellow and pale green.

Where, then, are all these apparently new virus diseases coming from? That is a question which is easier to ask than to answer. Part of the explanation may lie in the fact that growers and others are gradually becoming "virus-minded," and so are on the look out for these diseases which, in consequence, are investigated instead of being passed over as due to "nitrogen starvation" or "physiological troubles." This, however, cannot be the whole of the explanation, and there seems no reason to doubt that some of these new viruses have entered the country either in imported plants or by some other means. As stated earlier in this article, the writer had already observed one of the new viruses affecting the Tobacco crops in South-west France before it had been discovered affecting Tomatos in the British Isles, and this fact may be of great significance. In other words, it is extremely probable that some of these new Tomato viruses enter the country in the various brands of smoking tobacco. The next step is the transfer of the virus from the cigarette in the hand of the worker to the Tomatos under his care. This is easily accomplished, since viruses of the Tobacco mosaic group are very infectious, and it is an established fact that many commercial brands of smoking tobacco contain one or more of these viruses. These facts apply only to the second and possibly the third virus disease discussed in this article, since these are of the Tobacco mosaic type and not to the first disease which is caused by a different kind of virus.

The control of Tomato virus diseases is not an easy matter, and all that can be done is to make certain recommendations which will help to prevent the spread of these infections. Firstly, then, the men should not smoke while tending the Tomato plants, and if they are smokers should wash their hands before commencing their work. Secondly, it should be remembered that many of the Tomato viruses are very infectious and can be spread from diseased to healthy plants by means of the knife or of the hands. One grower, in whose Tomato crop the distorting virus disease had appeared, took the wise precaution of detailing one man to look after the infected houses only, and he was not allowed to enter the uninfected houses. Any young Tomato plants showing suspicious mottling should be removed and replaced by healthy plants.

Insects must be kept down by regular fumigation, since some at least of the Tomato virus diseases are spread by this means. Finally, it is better to keep Tomato plants by themselves as much as possible and not to grow them, when young, alongside various kinds of ornamental or other plants which may act as sources of virus infection to the Tomatos. It may be worth mentioning that Potatos, Cucumbers, Vegetable Marrows, Primulas and Delphiniums are all liable to infection with viruses which are easily transmitted to the Tomato, to say nothing of the long list of ornamental plants susceptible to infection with the virus of Tomato spotted wilt which were discussed in the July number of this JOURNAL.

In conclusion, the writer would like to express his indebtedness to Mrs. N. L. ALCOCK, Dr. HANLEY, Mr. HOWELLS and Mr. L. OGILVIE for sending the various Tomato plants from which these viruses were isolated.

SOME EXPERIMENTS IN ASPARAGUS CULTIVATION.

By A. N. RAWES.

THE first results of the experiments begun at Wisley in 1931 to determine the yield of Asparagus from male plants as compared with female, and the effect of close and wide planting, were reported in this JOURNAL, vol. 59, p. 74 (1934).

In the following notes the crops obtained in the first three seasons of cutting, 1933-4-5, are summarized.

Full details of the planting and routine cultivation of the selected material and the lay-out of the experimental beds are given in the previous report.

I. CROPPING OF MALE AND FEMALE PLANTS: Variety
'Connover's Colossal.'

The figures show saleable stems gathered over three seasons, 1933-4-5.

Series A consists of six beds. Three beds contain male plants, and three alternating with them contain female plants. The plants in all these beds are set in four rows with 3 feet between the rows and 2 feet between the plants, giving 64 plants to each bed.

<i>Male Plants.</i>		<i>Female Plants.</i>	
Bed No. 1	. . 2902	Bed No. 2	. . 1843
Bed No. 3	. . 3189	Bed No. 4	. . 1905
Bed No. 5	. . 3218	Bed No. 6	. . 1863
Total		Total	
9309		5611	

Series B consists of two beds, one of male and one of female plants, set in three rows, with 4 feet between rows and plants 2 feet apart in the rows, giving 48 plants to each bed.

<i>Male Plants.</i>		<i>Female Plants.</i>	
Bed No. 16	. . 2736	Bed No. 17	. . 1620

Series C consists of two beds, one of male and one of female plants, set in two rows, the rows being 4 feet apart with 3 feet between plants in the row, giving 33 plants to each bed.

<i>Male Plants.</i>		<i>Female Plants.</i>	
Bed No. 18	. . 2229	Bed No. 19	. . 1607

In *Series A*, *B* and *C* the total number of saleable stems from the male plants was therefore 14,274, and from the equal number of female plants given the same cultural treatment the saleable stems totalled 8838. The male plants have produced roughly 60 per cent. more saleable stems than the female in the three years.

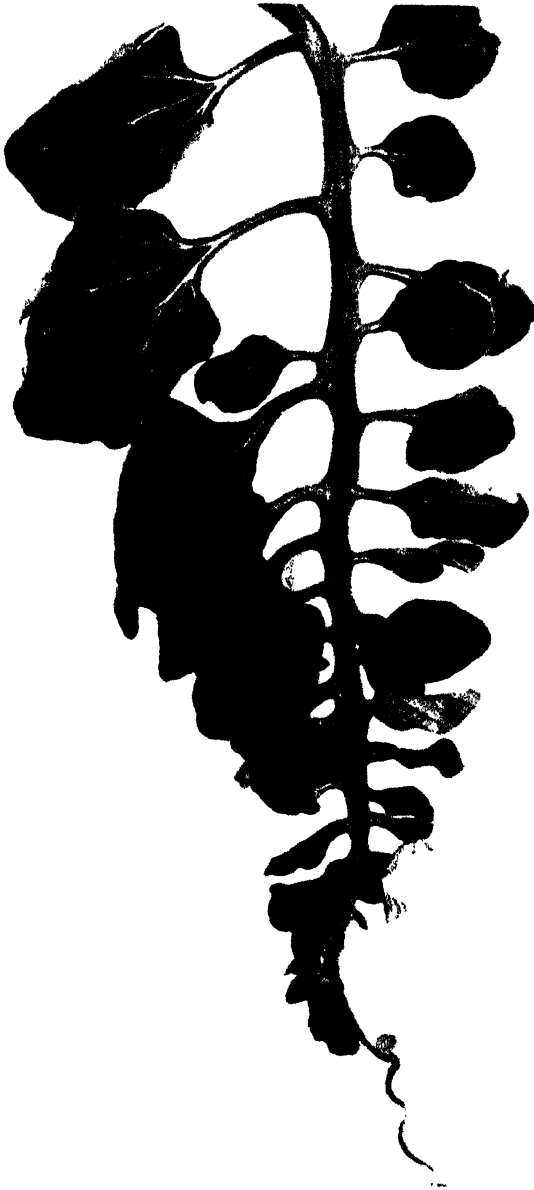


FIG. 145 DISTORTING VIRUS OF TOMATO.
Leaf ending in a corkscrew tendril and with numerous leaflets
(p. 449.)

To face p. 452.



FIG. 149. DISTORTING VIRUS OF TOMATO
Young plant showing distortions



FIG. 147. DISTORTING VIRUS OF TOMATO.
 A Normal leaf. B Distorted leaf.
 (p. 149.)

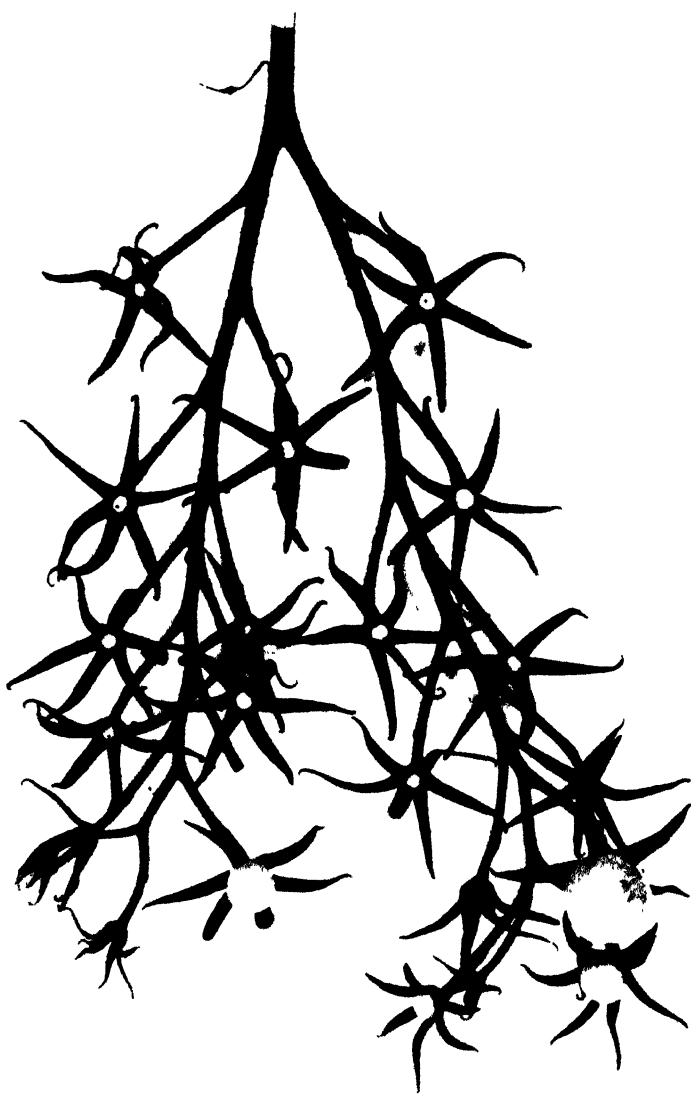


FIG. 148. DISTORTING VIRUS OF TOMATO.
Abnormal truss produced by virus-infected plant
(p. 449.)

Face p. 453.

II. GRADING: SIZE OF STEMS OF MALE AND FEMALE PLANTS.

On several occasions the stems as they were cut were graded roughly for size, and in the previous report of the 1933 cuttings it is shown that on the whole very little difference in the grades produced by male and female plants was noticeable. In the season of 1935 a count made from several cuttings gave the following result :

		<i>Large Stems.</i>	<i>Medium Stems.</i>	<i>Small Stems.</i>
Male Plants	.	53 per cent.	29 per cent.	18 per cent.
Female Plants	.	53 " "	31 " "	16 " "

The results over the three years clearly indicate the great value of male over female plants for planting, since they give a much greater return from a given area and so far without showing any inferiority in the size of stem produced, with the additional advantage that no seedlings spring up in the beds.

The higher percentage of yield of the male over the female plants has tended to increase rather than to fall back, having been 55 per cent. in the first year, and in the sum of three years over 60 per cent., and this increase of percentage yield is seen in each of the three series.

III. CROPPING OF CLOSE AND WIDE PLANTING: Variety 'Harwood's Giant.'

The arrangement of the beds and the results of total cropping over three seasons—1933-4-5—may be tabulated as follows :

	Number of Plants in Bed.	Planting Distance.	Number of Stems cut.	Number from a Crown.	Average Number from Square Yard.
Bed 7	48	4 ft. × 2 ft.	1810	37·7	37·7
" 13	48	4 ft. × 2 ft.	2078	43·2	43·2
" 8	66	3 ft. × 1½ ft.	2125	32·1	53·1
" 12	88	3 ft. × 1½ ft.	2094	23·7	52·3
" 9	88	2 double rows 1½ ft. apart with 4 ft. space. Plants			
		1½ ft. apart in rows	2233	25·3	51·9
" 11	88	2 double rows 1½ ft. apart with 4 ft. space. Plants			
		1½ ft. apart in rows	2167	24·6	50·3
" 10	132	2 treble rows 15 ft. apart with 4 ft. space. Plants			
		1½ ft. apart in rows	2499	18·9	47·8
" 14	33	4 ft. × 3 ft.	1417	42·9	29·5
" 15	33	3 ft. × 3 ft.	1586	48·0	39·6

As in the first year of cutting the results over the three years suggest that there is an optimum distance for planting, but the experiment must be continued for several years more before definite conclusions can be drawn.

The highest average yield from a square yard of bed was again neither from the beds containing the greatest number of crowns nor from those where the spacing was widest; the lowest average yield of a crown was where the space was least (Bed 10), the highest where the space was considerable (Beds 8, 12, 9, 11), not where it was greatest, just as was shown in the results from the first year.

BEARDED IRISES AT WISLEY, 1934.

THE trial of Bearded Irises at Wisley is being continued on the same lines as heretofore, and this report deals with the awards made in 1934 and with the disposition and acquisition of new varieties in that year.

The report follows the same plan as previous reports (see R.H.S. JOURNAL, 59, p. 172, and the varieties referred to may be grouped :

A. *Standard Collection.*

1. Varieties deemed worthy of cultivation in any garden in Great Britain—to these Awards have been made.
2. New varieties of promise not yet sufficiently proved and here described in small type.
3. New varieties planted with the foregoing for future judgment.

B. *General Collection.*

C. *Discarded varieties* which no longer merit a place in English gardens.

In 1934, after flowering the Bearded Irises were divided and planted on another site. The May frosts damaged them so severely that no judging was attempted in 1935.

AWARDS, DESCRIPTIONS, AND NOTES.

CLASS I. WHITE OR NEARLY WHITE VARIETIES.

Gudrun, A.M. 1934.—Vigorous and of rapid increase, with erect foliage, 22 inches high. Flower stems 30 inches high, erect, straight, 6-flowered; branches of medium length. Flowers large, stiff, well-proportioned. Standards domed, oval, $3 \times 2\frac{1}{2}$ inches, dull white, with a faint trace of blue, base with a trace of yellow. Falls straight-hanging, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, dull white, veins at beard and on haft pale yellow. Beard rich orange. Flowering for three weeks from May 31. Raised and sent by the late Mrs. W. R. Dykes. Introduced 1930. (58, 199.*)

MODESTIE.—Of moderate vigour and rather slow of increase, with erect foliage 20 inches high. Flower stems 32 inches high, erect, somewhat zigzag, branches short, 6-flowered. Flowers of medium size, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 2$ inches, white. Falls straight-hanging, $2 \times 1\frac{1}{2}$ inch., somewhat pinched, white, faintly veined pale bluish, veins on haft pale yellow. Beard pale orange. Flowering from June 8. Raised and sent by Messrs. Cayeux et le Clerc. (57, 70)

MY OWN.—Vigorous and of rapid increase, with erect foliage, 20 inches high, Flower stems 34 inches high, erect, somewhat zigzag, 6- or 7-flowered, branches

* The figures in parentheses refer to the volume and page in this JOURNAL where the last mention of the variety occurred. They show, among other things, the time the variety has been under trial.

of medium length. Flowers large, stiff, well-proportioned. Standards cupped. $2\frac{1}{2} \times 2\frac{1}{16}$ inches, white, with a very faint bluish tinge. Falls drooping, $2 \times 2\frac{1}{2}$ inches, white, veins yellowish-green at beard. Beard white, tips of hairs orange. Closely related to 'Kashmir White.' Flowering for eighteen days from May 28. Raised and sent by Captain R. D. R. Troup. (58, 152.)

CLODA.—Of moderate vigour and rather slow increase, with erect foliage, 20 inches high. Flower stems 30 inches high, erect, straight, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards somewhat cupped, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, white, base veined and tinged yellow. Falls straight-hanging, $2\frac{1}{2} \times 2$ inches, white; veins on haft distinct, pale yellow. Beard white, tips of hairs pale lemon. Flowering for two weeks from May 27. Raised by Mr. W. R. Dykes and sent by Mrs. W. R. Dykes. Introduced 1928. (56, 89.)

The following variety has been added for future judgment :

NATAL (Pilkington).

The following varieties have been relegated to the General Collection :

CYGNET : 42 inches ; June. (58, 119.)

UNNAMED WHITE : 30 inches ; May-June. (58, 119.)

FROZEN FOAM : 36 inches ; May-June. (58, 199.)

MICHELINE CHARRAIRE : 42 inches ; June. (58, 119.)

MOONLIGHT : 28 inches ; May-June. (58, 119.)

SHASTA : 38 inches ; June. (55, 132.)

WHITE AND GOLD : 22 inches ; June. (57, 70.)

The following variety has been discarded :

ZADA. (57, 70.)

CLASS II A a (1).

The following varieties have been relegated to the General Collection :

DELAROCHE : 30 inches ; May-June. (57, 70.)

E. L. CRANDALL : 24 inches ; May-June. (58, 122.)

MA MIE : 24 inches ; May-June. (58, 121.)

The following variety has been discarded :

POCAHONTAS. (58, 121.)

CLASS II A a (2).

The following variety has been relegated to the General Collection :

TRUE DELIGHT : 36 inches ; June. (58, 199.)

The following variety has been discarded :

BEAU IDEAL. (58, 122.)

CLASS II A b (1).

STIPPLES.—A vigorous variety with erect glaucous-green foliage, 18 inches high. Flower stems 32 inches high, somewhat zigzag, 8-flowered ; branches of medium length. Flowers large, stiff, well-proportioned. Standards domed, oval, $2\frac{1}{2} \times 1\frac{1}{2}$ inch., creamy-white, heavily speckled and suffused pale lavender-lilac. Falls drooping, $2\frac{1}{2} \times 2$ inches, colour as standards except middle less speckled. Beard white, tips of hairs yellow. Flowering for twelve days from June 6. Raised by Professor Edward O. Essig. Introduced 1928 by Carl Salbach, and sent by G. L. Pilkington, Esq. Nuée d'Orange \times Opera.

CLASS II A b (2).

The following varieties have been relegated to the General Collection :

JANE AUSTEN : 38 inches ; June. (58, 173.)

PRINCE CHARMING : 26 inches ; June. (58, 123.)

The following variety has been discarded :

MIDWEST. (56, 89.)

CLASS II B.

The following varieties have been discarded :

CASTOR. (56, 89.)

IONA. (58, 123.)

ZOUAVE. (58, 123.)

CLASS III a.

The following variety has been relegated to the General Collection :

ALHENA : 24 inches ; June. (58, 203.)

CLASS IV a.

KAMET.—Of rapid increase and vigorous, with erect foliage, 22 inches high, glaucous-green. Flower stems 38 inches high, erect, zigzag, 8-flowered ; branches of medium length. Flowers extra large, well-proportioned. Standards somewhat floppy, oval, $3\frac{1}{2} \times 3$ inches, pale silvery lavender. Falls straight-hanging, $3 \times 2\frac{1}{2}$ inches, pale rosy-lavender. Beard white, tips of hairs pale yellow. Flowering from June 1 for sixteen days. Raised and sent by G. P. Baker, Esq.

CLYTEMNESTRA.—Vigorous and of rapid increase, with erect foliage, tips lax, 24 inches high. Flower stems 32 inches high, erect, zigzag, 4-flowered ; branches very short. Flowers large, stiff, well-proportioned. Standards domed, oval, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, pale lavender. Falls straight-hanging, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich violet-purple, margins paler, veins brownish and distinct on haft. Beard white, upper half of hairs yellow, tips bronze. Flowering for ten days from June 16. Raised and sent by Messrs. R. Wallace, Tunbridge Wells. Introduced 1929. (56, 90.)

The following varieties have been relegated to the General Collection :

CONCHOBAR : 38 inches ; June. (56, 92.)

GENERAL GALLIENI : 24 inches ; June. (58, 127.)

GHAZI : 38 inches ; June. (57, 72.)

JUNION : 36 inches ; June. (55, 134.)

THUBAN : 32 inches ; June. (58, 203.)

The following varieties have been discarded :

AUTOCRAT. (59, 173.)

KILLYLEAGH. (57, 73.)

MARC AUREAU. (57, 71.)

SEEDLING NO. 35 (Baker).

CLASS IV b.

Joanna, A.M. 1934.—Plant vigorous, of rapid increase, with erect, glaucous-green foliage, 24 inches high. Flower stems 36 inches, erect, straight, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, oval, $3 \times 2\frac{3}{4}$ inches, deep rich violet-purple. Falls straight-hanging, $2\frac{3}{4} \times 2$ inches, very deep rich velvety violet-purple, veins distinct at haft. Beard conspicuous, deep blue, upper half of hairs deep yellow. Flowering from May 28 for eighteen days. Raised 1930 and sent by Major F. C. Stern, O.B.E. (59, 175.)

Fandango, A.M. 1934.—Described R.H.S. JOURNAL, 59, 174. (57, 73.)

Meldorle, A.M. 1934.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 22 inches high. Flower stems 40 inches, erect, straight, 8-flowered, branches short. Flowers large, well-proportioned, stiff. Standards domed, oval, $3\frac{1}{2} \times 2\frac{1}{2}$ inches, bright clear violet-blue. Falls almost horizontal, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich deep velvety violet-purple, veins pale brownish on haft. Beard bright clear yellow. Flowering for ten days from June 9. Raised by Dr. Ayres. Introduced 1930 and sent by Mrs. A. Hamilton Rowan. (59, 175.)

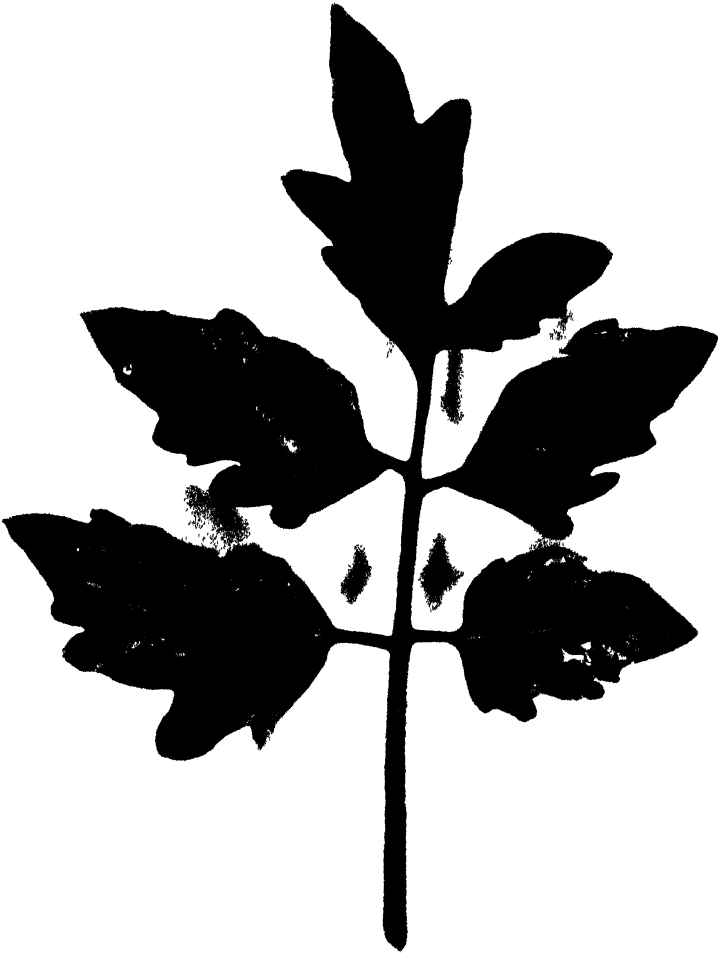


FIG. 149 VIRUS DISEASE OF TOMATO.
Mottled leaf produced by virus attack
(p. 450)



FIG. 150. VIRUS DISEASE OF TOMATO
Yellow leaf produced by virus attack
(p. 450.)

[To face p. 457.]

MESARTIM.—Of rapid increase and vigorous, with erect foliage, 22 inches high. Flower stems 36 inches, erect, straight, 10-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, oval, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich lavender-violet. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich velvety violet-purple, veins on haft distinct, brownish. Beard white, upper half of each hair deep yellow. Flowering for sixteen days from June 2. Raised 1928 and sent by Messrs. G. Bunyard. (58, 203.)

ZAMPA.—Plant vigorous and of rapid increase, with erect foliage, 20 inches high. Flower stems 34 inches, erect, straight, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, broad oval, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich lavender-blue. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich pale violet-purple. Beard bluish-white, apex of hairs deep yellow. Flowering for sixteen days from June 1. Raised and sent by Messrs. Cayeux et le Clerc. (57, 72.)

The following varieties have been relegated to the General Collection :

ANTONIO : 28 inches ; May-June. (57, 72.)
 AMY B. THOMAS : 36 inches ; June. (53, 130.)
 DESDEMONA : 38 inches ; May-June. (57, 71.)
 KING SOLOMON : 36 inches ; June. (56, 91.)
 PHOCER : 36 inches ; May-June. (57, 71.)
 ROXANE : 30 inches ; May-June. (57, 73.)

The following varieties have been discarded :

FLORIAN. (57, 71.)
 J. NORMAN. (53, 144.)
 MAROTTE. (57, 71.)
 MEGAS. (53, 130.)
 MINOS. (53, 130.)
 ROYAL RUTH. (58, 200.)
 VERONIQUE. (57, 71.)

CLASS IV c.

The following varieties have been relegated to the General Collection :

CUPAVO : 40 inches ; June. (57, 71.)
 NUMA ROUMESTAN : 30 inches ; June. (57, 71.)

The following variety has been discarded :

CELAENO. (58, 203.)

CLASS IV d.

Walter Godfrey, H.C. 1934.—Plant vigorous and of rapid increase, with erect, glaucous-green foliage, 24 inches high. Flower stems 36 inches, erect, somewhat zigzag, 8-flowered, branches short. Flowers large, well-proportioned, stiff. Standards domed, oval, $3 \times 2\frac{1}{2}$ inches, bright plum-purple. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, bright deep rich plum-purple, veins on haft brownish. Beard conspicuous, dull orange. Flowering for twelve days from June 6. Raised and sent by the late Mrs. W. R. Dykes. Introduced 1932. (58, 201.)

Arabella, H.C. 1934.—Of vigorous and rapid increase, with erect, glaucous-green foliage, 22 inches high. Flower stems 38 inches, erect, zigzag, 12-flowered, branches large, much branched. Flowers large, well-proportioned, stiff. Standards domed, broad oval, $3\frac{1}{2} \times 2\frac{1}{2}$ inches, deep rich dull plum-purple. Falls straight-hanging, deep velvety plum-purple, veins brownish-purple and distinct at beard and on haft. Beard dull smoky orange. Flowering for seventeen days from June 1. Raised and sent by Rev. Rollo Meyer. Introduced 1930. (59, 174.)

The following variety has been added for future judgment :

DESTINY (Burgess).

The following varieties have been relegated to the General Collection :

EVADNE : 36 inches ; May-June. (53, 134.)
 RAHRE : 32 inches ; May-June. (57, 72.)
 SEMINOLE : 36 inches ; May-June. (53, 134.)

The following varieties have been discarded :

FRAGRANS. (53, 134.)
 MONS. AUSTIN. (53, 134.)
 NADIA. (57, 72.)

CLASS V a.

Mary Barnett, H.C. 1934.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 22 inches high. Flower stems 32 inches, erect zigzag, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards cupped, obovate, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, clear pale lavender. Falls straight-hanging, $2 \times 2\frac{1}{2}$ inches, pale lavender, margins of haft veined pale brownish. Beard very conspicuous, orange. Flowering for eighteen days from May 26. Raised by Mrs. M. A. Cumbler. Introduced 1926 by Messrs. Farr and sent by G. L. Pilkington, Esq. (57, 72.)

Sensation, H.C. 1934.—Vigorous and free of increase, with erect, glaucous-green foliage, 24 inches high. Flower stems 36 inches high, erect, zigzag, 8-flowered, branches short. Flowers large, well-proportioned, stiff. Standards domed, $2\frac{1}{2} \times 2$ inches, lavender. Falls drooping, $2\frac{1}{2} \times 2$ inches, lavender with a rosy tint, veins brownish and distinct on haft. Beard white, upper half of hairs yellow. Flowering for eleven days from June 16. Raised 1925 and sent by Messrs. Cayeux et le Clerc. (57, 72.)

GRANNY.—Plant vigorous, of rapid increase, with erect foliage, 22 inches high. Flower stems 38 inches high, erect, straight, 10-flowered, branches of medium length. Flowers large, well-proportioned, stiff. Standards somewhat domed, $3 \times 2\frac{1}{2}$ inches, pale rosy-lavender, base veined and spotted darker. Falls straight-hanging, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, pale rosy-lavender, mottled and veined darker, old print dress effect, margins of haft veined brownish. Beard white, upper half of hairs bright yellow. Flowering for twelve days from June 2. Raised and sent by G. P. Baker, Esq. Encorceleur \times Los Angeles. (57, 70.)

WYNN HELLINGS.—Vigorous and free of increase, with erect foliage, 26 inches high. Flower stems 38 inches high, erect, straight, 10-flowered, branches of medium length. Flowers large, well-proportioned, stiff. Standards domed, $3 \times 2\frac{1}{2}$ inches, bright lavender. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, veins distinct at beard and on haft. Beard white, upper half of hairs deep yellow. Flowering for two weeks from June 16. Raised 1927 and sent by F. Wynn Hellings, Esq. Astronome Nordmann selfed. (58, 92.)

CALIXA.—Plant vigorous and of rapid increase, with erect, glaucous-green foliage, 20 inches high. Flower stems 34 inches high, erect, straight, 8-flowered, branches short. Flowers large, well-proportioned, stiff. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, clear rich lavender. Falls straight-hanging, $2\frac{1}{2} \times 2\frac{1}{2}$ inches. Beard white, tips of hairs yellow. Flowering for three weeks from May 26. Raised, introduced 1930, and sent by the late Mrs. W. R. Dykes. (58, 201.)

The following varieties have been added for future judgment :

BLUE JUNE (Donahue).

MAGNET (Steffen).

COMMODORE FELLOWES (Harding).

The following varieties have been relegated to the General Collection :

CARMELO : 28 inches ; June. (53, 152.)

PEITHO : 30 inches ; June. (58, 201.)

SOUV. DE LOETITIA MICHAUD : 36 inches ; June. (56, 92.)

VIKING : 30 inches ; May-June. (58, 137.)

The following varieties have been discarded :

CLÉMENT DUBUFFE. (57, 71.)

LOUIS TROWBRIDGE. (58, 137.)

CLASS V b.

NEMO.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 22 inches high. Flower stems 32 inches high, erect, somewhat zigzag, medium length branches, 9-flowered. Flowers large, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich violet-blue. Falls drooping, $2\frac{1}{2} \times 2$ inches, rich violet-blue, veins of beard and on haft distinct, brown. Beard bluish-white, upper half of hairs orange. Flowering for ten days from June 16. Raised 1927 and sent by Messrs. Cayeux et le Clerc. Mesoptamica \times Seedling.

The following varieties have been added for future judgment :

BLUE VELVET (Loomis).

SAN DIEGO (Mitchell).

SANTA CLARA (Mitchell).

STRATOSPHERE (Donahue).

The following varieties have been relegated to the General Collection :

LA PUCELLE : 36 inches ; June. (57, 72.)

Mrs. PHILIP RUNCIMAN : 30 inches ; May-June. (56, 93.)

The following variety has been discarded :

PETRARQUE. (57, 72.)

CLASS V c.

FASCINATION.—Plant vigorous and of rapid increase, with erect, glaucous-green foliage, 20 inches high. Flower stems 36 inches high, erect, straight, 10-flowered, branches very short. Flowers large, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, bright rosy-lilac. Falls straight-hanging, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, veins distinct on haft, pale brownish. Beard white, upper half of hairs orange. Flowering for ten days from June 16. Raised 1927 and sent by Messrs. Cayeux et le Clerc. (57, 72.)

The following variety has been added for future judgment :

PILLNITZ (Steffen).

The following varieties have been discarded :

RAMLAHS. (55, 134.)

WILD ROSE. (58, 140.)

CLASS V d.

Magenta, A.M. 1934.—Plant vigorous and of rapid increase, with erect, glaucous-green foliage, 22 inches high. Flower stems 36 inches high, erect, zigzag, 9-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, $3\frac{1}{2} \times 2\frac{1}{2}$ inches, deep magenta-purple. Falls drooping, $2\frac{3}{4} \times 2$ inches, as standards but middle darker. Beard white, apex of hairs bronze. Flowering for twelve days from June 12. Raised 1927 and sent by Messrs. Cayeux et le Clerc. (57, 72.)

The following variety has been added for future judgment :

MA BELLE (Burton).

The following variety has been relegated to the General Collection :

CENGIALTI THE CZAR : 12 inches ; May-June. (58, 141.)

CLASS VI a (1).

Anne Marie Cayeux, A.M. 1934.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 20 inches high. Flower stems erect, 32 inches high, straight, 9-flowered, branches short. Flowers large, stiff, well-proportioned. Standards cupped, almost circular, $2\frac{3}{4} \times 2\frac{1}{2}$ inches, dull smoky lavender, base yellowish. Falls straight-hanging, $2\frac{1}{2} \times 2$ inches, bright electric-blue at beard and on haft pale smoky brown. Beard deep yellow. Flowering for eleven days from June 18. Raised 1928 and sent by Messrs. Cayeux et le Clerc.

Rhadi, H.C. 1934.—Vigorous but slow of increase, with erect, glaucous-green foliage, 22 inches high. Flower stems 32 inches, erect, zigzag, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, $3 \times 2\frac{1}{2}$ inches, very pale bluish-white with occasional smoky yellow patches, base veined brownish. Falls almost horizontal, $2\frac{1}{2} \times 2$ inches, dull smoky lavender overlaid pale smoky yellow, blotched reddish-purple. Beard dull deep orange. Flowering for twelve days from June 1. Raised and sent by the late Mrs. W. R. Dykes. (56, 96.)

The following variety has been added for future judgment :

NINGALL (Ayres).

The following varieties have been relegated to the General Collection :

ALLURE : 32 inches ; June. (55, 139.)
 QUERIDA : 38 inches ; May-June. (57, 201.)
 SIERRA LEONE : 24 inches ; June.

The following varieties have been discarded :

CASSIOPEE. (53, 142.)
 JORDAENS. (53, 142.)
 MARDI. (57, 73.)

CLASS VI a (2).

The following variety has been added for future judgment :

CAPTAIN COURAGEOUS (Rowell).

The following varieties have been relegated to the General Collection :

CANDLELIGHT : 46 inches ; June. (57, 73.)
 GEORGE YELD : 36 inches ; May-June. (56, 93.)
 MME. CHERI : 34 inches ; June. (53, 143.)
 MONS. BRUN : 28 inches ; June. (53, 143.)
 RAMONA : 28 inches ; June. (53, 143.)
 VICTOR HUGO : 30 inches ; June. (57, 73.)

The following varieties have been discarded :

ARCTURUS. (56, 93.)
 MA CHERIE. (53, 152.)
 ONTARIO. (58, 201.)

CLASS VI c (1).

Potree, H.C. 1934.—Plant of moderate vigour and of rapid increase, with erect foliage, 22 inches high. Flower stems erect, 30 inches high, somewhat zigzag, 6-flowered, branches short. Flowers of medium size, stiff, well-proportioned. Standards cupped, $1\frac{1}{2} \times 1\frac{1}{2}$ inch, bright clear mahogany-red. Falls drooping, $1\frac{1}{2} \times 1\frac{1}{2}$ inch, deep rich velvety mahogany-red, veins distinct on haft. Beard bright orange. Flowering for two weeks from June 4. Raised and sent by Messrs. R. Wallace. (56, 93.)

MELCHIOR.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 24 inches high. Flower stems 36 inches, erect, zigzag, 8-flowered, branches short. Flowers large, well-proportioned, stiff. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, dull deep smoky plum-purple. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, rich velvety wine-purple, veins brown and distinct on haft. Beard orange. Flowering for two weeks from June 10. Raised 1927 and sent by Messrs. R. Wallace. (56, 94.)

The following varieties have been added for future judgment :

CHEERIO (Ayres).
 GRAND MONARCH (Rowell).
 SACHEM (Loomis).
 WELLINGTON (Burgess).

The following have been relegated to the General Collection :

ANDROMEDA : 36 inches ; June. (58, 203.)
 BABYLON : 36 inches ; June. (56, 94.)
 CASSANDRE : 40 inches ; June. (57, 73.)
 DON JUAN : 36 inches ; May-June. (57, 74.)
 DURANDAL : 32 inches ; May-June. (57, 73.)
 H. CORREYON : 30 inches ; May-June. (57, 73.)
 KHAMA : 36 inches ; June. (56, 94.)
 LABOR : 32 inches ; June. (57, 73.)
 LYRA : 40 inches ; June. (56, 94.)
 SURAYNA : 42 inches ; June. (57, 71.)

The following varieties have been discarded :

AUBURN. (53, 146.)
 GLUCK. (57, 74.)
 MRS. HAMILTON ROWAN. (58, 202.)
 RAMELDO. (55, 139.)

CLASS VI c (2).

King Midas, A.M. 1934.—Described in R.H.S. JOURNAL, 59, 178. (58, 202.)

Shah Jehan, H.C. 1934.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 24 inches high. Flower stems erect, straight, 43 inches high, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, oval, $2\frac{1}{2} \times 1\frac{1}{2}$ inch, dull smoky yellow, faintly tinged dull lavender, base bronze. Falls straight-hanging, $2\frac{1}{2} \times 1\frac{1}{2}$ inch, rich deep brownish-purple shading to violet-purple at tips, veins on haft chestnut. Beard very conspicuous, old gold. Flowering for ten days from June 8. Raised by Mr. E. W. Neel. Introduced and sent by the Orpington Nursery Co.

NANETTE.—Plant vigorous and of rapid increase, with erect foliage, 18 inches high. Flower stems 30 inches high, erect, zigzag, 8-flowered, branches short. Flowers large, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, dull smoky yellow. Falls drooping, rich velvety reddish-purple, margins pale smoky yellow, veins brownish, distinct on haft. Beard orange. Flowering for two weeks from May 24. Raised by Messrs. Millet et Fils and sent by B. R. Long, Esq. Dominion \times ? (56, 94.)

WITCHERY.—Of moderate vigour and rather slow of increase, with erect foliage, 16 inches high. Flower stems 28 inches high, erect, zigzag, 8-flowered, branches short. Flowers of medium size, stiff, well-proportioned. Standards domed, $2 \times 1\frac{1}{2}$ inch, dull smoky old gold flushed pale purple. Falls almost horizontal, $1\frac{1}{2} \times 1\frac{1}{2}$ inch, bright lavender, margins shaded yellow. Beard orange, tips of hairs bronze. Flowering for nine days from June 10. Raised and sent by the Orpington Nursery Co. Introduced 1929. Sunset \times Shekinah. (56, 94.)

AUSTRALIA.—Of vigorous habit and rapid of increase, with erect foliage, 22 inches high. Flower stems 42 inches high, erect, straight, 8-flowered, medium-length branches. Flowers large, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, dull smoky bronze, fairly flushed lavender. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, dull reddish-wine, margins smoky yellow. Beard orange. Flowering for two weeks from May 30. Raised and sent by Mr. G. L. Pilkington. Menetrier \times Bruno. (58, 202.)

The following varieties have been relegated to the General Collection :

SUNSET : 36 inches ; June. (58, 146.)

ZAHARON : 32 inches ; May-June. (56, 96.)

The following varieties have been discarded :

AQUILA. (56, 94.)

HELA. (56, 94.)

LUCRETIA. (58, 152.)

SEEDLING (Egelberg). (56, 96.)

TROYON. (57, 74.)

CLASS VII a.

The following variety has been discarded :

MINNEHAHA. (58, 147.)

CLASS VII b.

CANADA.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 24 inches high. Flower stems 38 inches high, erect, straight, 8-flowered, branches of medium length. Flowers large, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, dull pale smoky yellow. Falls drooping, $2\frac{1}{2} \times 2\frac{1}{2}$ inches, pale reddish-wine, margins smoky pale yellow. Beard pale yellow. Flowering for two weeks from May 27. Raised and sent by Mr. G. L. Pilkington. Menetrier \times Bruno. (58, 202.)

The following varieties have been discarded :

MUSCADIN. (57, 74.)

SEQUANA. (57, 74.)

SOLANA. (56, 95.)

CLASS VII *d*.

The following varieties have been added for future judgment :

MELBOURNE (Pilkington).

M. 10 C. (Pilkington).

M. 10 E. (Pilkington).

The following variety has been relegated to the General Collection :

ARGYNNIS : 26 inches ; June. (56, 95.)

The following variety has been discarded :

GIRARDON. (57, 74.)

CLASS VIII *a*.

CATHAY.—Vigorous and of rapid increase, with erect, glaucous-green foliage, 22 inches high. Flower stems erect, 30 inches high, zigzag, 8-flowered, branches short. Flowers of medium size, stiff, well-proportioned. Standards domed, $2\frac{1}{2} \times 1\frac{1}{8}$ inch, bright deep yellow. Falls drooping, $2 \times 1\frac{7}{8}$ inch, primrose-yellow, margins darker, veins brownish-purple at beard and on haft. Beard orange. Flowering for two weeks from June 2. Raised and sent by Messrs. R. Wallace. (58, 203.)

The following varieties have been relegated to the General Collection :

JASON : 26 inches ; June. (56, 95.)

RAYO DE SOL : 32 inches ; May-June. (58, 203.)

CLASS VIII *b*.

The following variety has been added for future judgment :

RHODESIA (Pilkington).

The following variety has been discarded :

IGRAINE. (56, 96.)

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

***Calluna vulgaris* 'J. H. Hamilton.'** A.M. August 27, 1935. From Messrs. Maxwell & Beale, Broadstone. A desirable Heather of dwarf, spreading habit, producing an abundance of bright rosy-pink double flowers.

****Catananche coerulea* 'Perry's White.'** A.M. July 22, 1935. From Messrs. Perry, Enfield. Plant vigorous, of erect habit, 2½ feet tall; foliage dark grey-green. Flower stems long, erect, wiry. Flowers double, white, with creamy anthers, 1½–2 inches diameter. Very free-flowering. Raised by sender.

****Dianthus Allwoodii* 'Daphne.'** A.M. July 22, 1935. From Messrs. Allwood, Haywards Heath. Plant of vigorous growth and compact habit, 1½ feet tall, free-flowering. Flower stems stiff, erect, branched. Flowers single, 1½–2 inches diameter, of good form and substance, deep salmon-pink zoned deep crimson at eye; margins of petals fringed. Raised by sender.

****Dianthus alpinus* 'Mars.'** H.C. July 22, 1935. From Messrs. Allwood. Plant of compact, bushy habit, 6 inches high. Flower stems erect, stiff, one or two flowered. Flowers semi-double, 1–1½ inch diameter, bright rich scarlet-crimson. Raised by sender.

***Eremurus Alchisonii*.** A.M. August 27, 1935. From Messrs. Clark, Dover. This species was discovered many years ago at altitudes of 11,000 to 12,000 feet in Afghanistan, and is closely allied to the more familiar *E. robustus*. The long, tapering raceme bears many blush-white flowers striped externally with brownish-rose.

***Gentiana Pneumonanthe* var. *depressa*.** A.M. August 27, 1935. From T. Hay, Esq., Hyde Park, London. A plant of tufted habit, with many erect growths 4 to 5 inches high clothed with narrow, dark green leaves and bearing tubular, dark blue flowers striped externally with green.

***Lilium dauricum* var. *venustum* f. *Batemanniae*.** A.M. August 13, 1935. From the Knap Hill Nursery Co., Woking. *Lilium dauricum* has a wide distribution in North-Eastern Asia, and exhibits considerable variation. The variety *venustum*, of which the present plant is a particularly fine form, is distinguished by its clear apricot-coloured, unspotted flowers, with widely spreading segments.

***Nymphaea tetragona alba*.** A.M. August 13, 1935. From Messrs. Perry, Enfield. A diminutive Chinese Waterlily, which can be grown in very shallow water in small pools. The bronze-green leaves are scarcely more than 2 inches across, ovate with acute basal lobes; the flowers somewhat smaller with four pointed greenish sepals and eight to ten narrow white petals.

Rudbeckia maxima. A.M. August 27, 1935. From the Director, R.H.S. Gardens, Wisley. A handsome species from the Southern United States. The erect stems attain a height of 7 feet and bear several orbicular-ovate, glaucous, entire leaves 8 inches long. The flower-heads, which are composed of 10 to 12 large bright yellow rays and a narrow black central cone, are produced at the top of the main stem and on a few slender branches.

Scabiosa Fischeri. A.M. August 27, 1935. From T. Hay, Esq., Hyde Park, London. A pretty perennial species from Dahuria. The habit is bushy, the leaves pinnatisect with narrow lobes, and the numerous flower-heads, 2 inches across, of a pleasing lavender colour.

Stokesia cyanea var. **superba.** A.M. August 13, 1935. From T. Hay, Esq., Hyde Park, London, W. 2. A useful, late-flowering hardy perennial 2½ to 3 feet in height. The erect stems are freely branched in the upper half and well furnished with lanceolate leaves entire except for a few prominent teeth near the base. The flat, lavender-coloured flower-heads are 3 inches in diameter, the outer row of florets prettily serrated.

GARDEN NOTES.

Nomocharis oxypetala BALF. F. (fig. 130).—Those interested in Liliaceous plants will welcome the news that at last this species of *Nomocharis* has been introduced to cultivation in Britain. In June 1935 a plant thought to be a Lily was presented to the Royal Horticultural Society's Garden at Wisley by Mr. WALTER L. IRVINE, F.R.H.S., of Blakeway Gardens, Bromborough, Cheshire, who stated that it had been found by his friend Mr. MARCO PALLIS, Aigburth, Liverpool, who was exploring and climbing on the Gangotri Glacier at the source of the Ganges. In sending the plant to Wisley Mr. IRVINE wrote: "I have nine plants of it, six of which have flowered this year. The bulbs reached me about the middle of August 1933."

As the plant was not known, a photograph was taken on its arrival at Wisley. This gives a fair representation of the plant, though it was slightly shaken in its transit by post. Professor Sir WILLIAM W. SMITH of the Royal Botanic Garden, Edinburgh, who kindly identified the dried flower and photograph when it was sent to him, remarks: "This is the long-sought-for *N. oxypetala* Balf. f., WALLICH's *Fritillaria oxypetala*, and the locality from whence it came would appear to be right in the heart of the known distribution area of the species."

Considerable confusion has attended the identification of this plant in the past, and ROYLE in Ill. Bot. Himal. (1839) describes it as *Fritillaria oxypetala*, while in 1882 it was named *Lilium triceps* Klotzsch. By BAKER it was placed under *Lilium oxypetalum*.

For a full account of this species reference may be made to the revision of the genus *Nomocharis* by W. EDGAR EVANS in the "Notes of the Royal Botanic Garden, Edinburgh," Vol. XV, No. LXXI, where the confusion in regard to its identification is detailed, and the plant fully described and figured by a photograph made from a dried specimen.

Briefly the plant may be described as having a slender stem about 8 inches in height with alternate dark green leaves, rather leathery in texture, and bearing a solitary rather pendulous flower at the apex of the stem. The perianth lobes are creamy or greenish-yellow, about an inch and a quarter long and thin in texture.

Although it may not rank in beauty with such plants as *N. Mairei*, *N. pardanthina*, *N. aperta* and others, Mr. PALLIS must be congratulated on having successfully introduced to cultivation a plant of such rarity from its habitat in the N.W. Himalaya.

The Field Note given by the collector runs as follows :

"Elevation about 11,500 to 12,500 feet in the Khyarkuti Valley, tributary of the main Upper Ganges Valley, found near the bottom

of the valley on the edges of Birch woods. Climate probably rather sheltered, general direction of valley opening faces south, just within monsoon area but rains light. Soil is probably rich. There are open alps of rich long grass with Irises and Potentillas and bands of Birch wood with large white Rhododendrons underneath in all directions both on the slopes and in the bottom of the valley. The plant was observed in the first half of July 1933."

It is interesting to note that in May 1933 Mr. A. E. OSMASTON sent seeds which he had gathered in Kumaon of what he considered to be this species. Several seedlings were raised and are now growing in the gardens at Wisley. They cannot, however, be expected to flower for at least two years and their identity remains to be established.—*R. L. Harrow.*

The Newer Gentians.— Both *Gentiana lhaguensis* (K.W. 10860 and K.W. 10761) continue to flower at the date of writing (September 1), and they are obviously very close to, if not identical with, *G. Veitchiorum*.

It is good, however, to have more of *G. Veitchiorum*, which flowering early as it does, and with its deep blue and most abundant bloom and good constitution, ranks very high in the group.

The white form of *G. sino-ornata* proves to be of the Kingdon Ward collecting, although there is only one plant of it out of the many of those raised from the K.W. mixed *sino-ornata* seed. The other plants of this batch are either an early flowering, pale form of *G. sino-ornata* or some species nearly akin to it. They have not quite the size of flower of *G. Farreri*, although they resemble it in colour and flower at about the same time.

The Gentian Mc.L. 220 proves to be a very strong form of *G. sino-ornata*, and one which blooms earlier than the type. The colour of its flowers, however, is medium blue and the flowers are very large; this should be a good thing.

Another early flowering form of *G. sino-ornata* is now in bloom, a much better form than the one mentioned in last month's note as refusing to open its flowers; but even this plant, although very valuable in lengthening the season of bloom, beginning as it does two or three weeks earlier than the type plant, does not open its flowers quite as fully and continuously as does the latter.

G. ornata continues to be very lovely with its close growing, turf-like habit and its wide open sky-blue flowers—better flowers than those of *G. gilvo-striata*, although the latter is most distinct in its foliage, which is like that of an encrusted Saxifrage. *G. gilvo-striata* does not appear to be quite as free flowering as others of the section.

Of hybrids *G. hexa-Farreri* is first class, very early, and of good constitution. It has a medium blue flower; *G. sino-ornata* × *Veitchiorum* has a very large rich blue flower and a splendid constitution, promising to be a really first-class hybrid.

Mr. Macaulay's fine *Lawrencei* hybrids have large pale sky-blue flowers, paler even than those of *G. Farreri*. They seem to be of better constitution than their parent.

Among hybrids, however, *G. × Macaulayi* itself, in its best form, takes a great deal of beating.

Seedlings that have been raised of K.W. 1109 C. and of *G. Georgei* will not flower this year.—*Lord Aberconway, Bodnant.*

Rhodohypoxis Baurii.—In his lecture on new alpine plants (p. 255) Dr. ROGER SMITH attributed the introduction of *Rhodohypoxis Baurii* to Messrs. BAKER of Codsall, Wolverhampton. That firm informs me that though the plant came into commerce through them the plant was not really made available by their efforts, but by Mrs. GARNETT-BOTFIELD, in whose garden at Albrighton it was raised and increased.

The plant first became known to botanists through dried plants in a collection made by the Rev. R. BAUR on the Baziya Mountains in Transkeian Kaffraria in November 1875. This was the red-flowered plant, and it was described by J. G. BAKER under the name *Hypoxis Baurii* in 1876, who also described a white form which had been collected in Natal under the name *H. platypetala*, which he subsequently corrected to *H. Baurii* var. *platypetala*. Later NEL, on account of certain structural peculiarities in the anthers, etc., made a new genus for it and one or two other plants, upon which the name of the red form became *Rhodohypoxis Baurii*, with the white variety *R. Baurii platypetala*, and by these names we now know them. Both forms are beautifully figured in the Botanical Magazine, t. 9412.

Soon after the dried plants were described living plants were grown by MAX LEICHTLIN at Baden, with whom it flowered in 1877, having reached him from Mr. MACOWAN, who had sent Mr. BAUR's specimens to Kew. These were the first living plants to be seen in Europe, but the plants thus introduced seem to have been lost, and it was not until much later that they became generally available. This was through the careful cultivation of some plants which reached Mrs. GARNETT-BOTFIELD in a piece of turf collected for her by a lady in the Drakensberg Mountains. Both red and white forms were obtained from this turf and also *Scilla Adlamii*, and Awards of Merit were given to both forms when shown by her on May 24, 1927. Mrs. GARNETT-BOTFIELD saved seed and raised seedlings until now the stock of the plants in cultivation has reached very considerable numbers and it is growing in many gardens. Seedlings have shown considerable variation in colour and many are pink. These pink forms generally fade as the flowers age, but some retain the pink colouring very well. There is also much variation in the width of the perianth segments. These in the best forms overlap considerably, and no doubt the name *platypetala* was given in allusion to this character in the white-flowered plant to which it was first attached.

A further collection was made and brought into cultivation quite recently.

Mrs. GARNETT-BOTFIELD has kindly described her method of growing these beautiful plants with which she has had so much success. She writes :

"We grow *Rhodohypoxis Baurii* and its variety *platypetala* in quantities in this garden. Our soil is a good lime-free loam, rather water-logged in winter and cold.

"About nine years ago we introduced this plant to the rock garden, and we have found it perfectly hardy even in an undrained position, where it was temporarily under water in winter.

"At first we thought that a plant from the Drakensberg Mountains of Natal would want a hot, sunny place and well-drained, sandy soil. Experience has shown that it responds better to good soil, enriched with leaf-mould or old manure and kept open and free by sand. Our method now is to divide and plant at the end of July or during August for outside positions, or divide and pot up in September for frames or alpine house. It does not matter if the plants are still in flower ; they do not mind disturbance at all, and they grow away much more satisfactorily if divided while in full growth than they do when dormant.

"For pots we make a good normal potting mixture of loam, leaf-mould, and sand. For outside we enrich the soil with leaf-mould or old manure and a fair amount of sand.

"In this way you will get larger flowers and a longer period of flowering, but the plants grow quite well without any fuss in ordinary soil, provided there is no lime in it.

"We sow the seed as soon as ripe in a cold frame, and it either germinates fairly soon or lies dormant till spring. We prick out the seedlings, when the first leaves are half to three-quarters of an inch long, into boxes of good soil, leaf-mould, and sand, and keep in a cold frame for the winter, potting them off or planting them out at the end of May. The plants will flower in about twelve months' time from the pricking out."

BOOK REVIEWS.

"The Garden Grows. A Story." By John F. Leeming. 8vo. 229 pp. (Harrap, London, 1935.) 7s. 6d.

By the addition of the words "A Story" to the title the author has excused himself from an obligation to write not only "the whole truth" but also "nothing but the truth."

Otherwise we might expect valuable facts to guide others along a royal road for gardeners, ending in the achievement of a perfect garden.

It is disappointing to find so little that is sufficiently practical and instructive for would-be gardeners to make use of to hasten the growth of their gardens, and yet so little that is exciting enough to be called a plot, in the literary sense, in the course of the story.

It is bewildering to be obliged to guess whether the author is giving us his own views and experience or treating himself as part of the fiction that has created his imaginary companion or second self, one Holtzpeffler.

For instance we should like to be told the scientific name of the White Broom "that does not grow stragglingly," and which "seed-merchant" supplies under that name.

Instead of such useful teaching the author ignores, or pretends that he ignores, Latin names, and that it is a wonder that the mythical gentleman with the faked German name did not slay the man who called a Hollyhock by its correct and very charming name, *Althaea rosea*.

Colour scheming has become a fetish with some, so it is pleasant to find it wittily derided. However, there are some people who might dislike the combination, so highly praised, of Paul's Scarlet Thorn and Yellow Laburnum, as much as they would the eating of raspberry jam with a poached egg, unless they possessed an overwhelming affection for the colours of the Spanish flag.

The book is written in a delightfully simple manner and in such good English that the reader is lured on, hoping for valuable lessons from the experiences that made the charming garden shown in the illustrations, which at any rate are not fictitious.

The chapter dealing with the animals is the most disappointing. The Miraculous Rabbit is too parthenogenetic even for fiction and the biographies of most of the animals scarcely worth such detailed chronicling. The Barn chapter is the best and is full of interest and good descriptions. In reading it, we feel that the author really enjoyed creating, garden, barn and book, so must be forgiven for so doing, though he has not taught us enough that we may be equally successful.

"Magic in the Woods." By G. H. Browning. 8vo. x + 122 pp. (Burns, Oates & Washbourne, London, 1935.) 3s. 6d.

A book of trees for children with coloured illustrations of the common trees of Great Britain and legends concerning them, culled from mythology, legend, folk-lore and fairy-tale. The language on the whole is simple, the facts accurate.

"Mr. Middleton Talks about Gardening." 8vo. 248 pp. (Allen, Unwin, London, 1935.) 5s. net.

Mr. Middleton's voice and ideas are well known to all who listen to the weekly broadcast talks on gardening, and they will like to have his remarks in print. Here are reminders for all the months in the year—remarks on flowers and hedges and trees, on fruit and vegetables, on manures and the greenhouse, and many other things, with sound suggestions imparted in a racy way.

Like most of those who set out to write a notice of a book we have sought to find something to warn its readers against, and we have had to spend quite a long time about it (not unpleasantly, though). Almost all his advice we should consider good, but you who would plant a hedge do not follow him there, for his first suggestion is *Cupressus macrocarpa*, and that indeed makes the world's worst hedge more often than not. It can be beautiful, but no one can say whether it will be beautiful for long or an eyesore very soon, as many have found in this present year.

"Old Roses" By Mrs. Frederick Love Keays. With 56 illustrations. 8vo. 222 pp. (The Macmillan Co., New York.) 12s. 6d.

Mr. Hardcastle loved everything that was old: old friends, old manners, old books, old wines, and doubtless, had he been a rosarian he might have added, old roses. For old roses are quite an interesting study to some of us, and this study may be of practical importance in helping to direct modern improvements on the right lines.

As a business proposition the sale of old roses must be small, but we have one or two nurserymen who think it worth while to keep a corner of their catalogues for the older forms, and to them we must be grateful.

This book is by an American lady and the illustrations, save for the frontispiece, are in black and white. Many of them are artistic, particularly the photographs from Redouté, but they demonstrate in a striking manner how great has been the advance of some of our roses of to-day in beauty of form.

The range of colour of the modern roses has also far outstripped anything known to the rosarian of an older day.

This our authoress fully appreciates. "Old roses," she says, "are not competing with modern roses any more than are Iris, Peonies, Cotoneasters or Snowballs. They are different. Their uses are different. Their garden habits serve different ends. Pleasure in them is different. From them we gain new and different perceptions of rose nature. . . . We perceive scents unknown or long forgotten. Nothing awakens associations more than odour. The old timey perfume of the *Centifolia*" (Lord St. Aldegonde demanded the cabbage rose), "the dusky sweetness of the Damask, the refreshing acid sweetness of the China roses, the penetrating gracious sweetness of Tea roses, the woody pungency of the mossy glands on Moss roses, the scent of winter apples in the foliage of the Sweetbrier—all scents of roses, and yet how various."

She suggests that old roses may not offer much in the cause of rose breeding. Our British raisers (with one or two praiseworthy exceptions) do not give—possibly they do not always know—the parentage of their new forms, but it is rumoured that one at least of our more successful raisers has made considerable use of older varieties.

The book is rather a description of the old roses that the authoress has grown or been able to find, than a general review of old varieties, but incidentally, she appears to have covered most of the ground, down to the year 1880, which she gives arbitrarily as the determining date for an "old" rose. She calls the Tea roses "the extreme expression in roses of what is most delicately beautiful" and fears their extinction. But I fancy this is largely a matter of climate. A correspondent told me recently that in parts of Australia they could pick Tea roses all the year round, and in such places their survival is probably assured—in England we are not so favoured. Shirley Hibberd advised growing them under glass, and out of doors the Hybrid Tea gives better returns in most cases from the labour expended. She complains that she has not found pink or yellows among the Teas, but 'Mme. Cusin' and 'Mme. Henri Berges,' which she does not mention, are good rose pinks and though there is perhaps no clear yellow of the shade of 'Mabel Morse,' 'Perle des Jardins' and 'Mme. Falcot,' which she names, have distinct yellow colouring.

She has a final chapter on uses for old roses which may be studied by those who wish to take up this interesting hobby.

H. R. DARLINGTON.

"Green Peas." By A. H. Hoare. Bull. 81. Ministry of Agriculture and Fisheries. 8vo. v + 73 pp. (H.M. Stationery Office, London, 1935.) Paper covers, 1s. 6d.

After a brief history of the garden Pea with the names of raisers of well-known varieties, and some account of the botany and genetics of the Pea, and of its food value, all dealt with in a clear fashion, a list of varieties with their characteristics is given. Care is taken to point out the market requirements.

Following this is a useful summary of the principal pea-growing districts, of which Essex, Yorkshire and Lincolnshire are the chief, with the varieties mostly grown and the markets they supply. It is pointed out that a well-drained soil is necessary, and that deep loams containing ample lime give the best results.

The routine followed in three typical districts—viz. Essex, West Norfolk and Holland, and Somerset—is described, and then the details of picking and marketing.

Shorter chapters deal with the cultivation of Peas in gardens and allotments, growing Peas for drying and for canning, with remarks on the varieties suitable for each purpose.

The information given is accurate and clearly expressed, and the Bulletin gives a good introduction to the matter with which it deals, though here and there greater detail would have been an advantage. A cottager, for instance, would like to learn how far a pint of seed will go, and a good many will be much surprised to learn that a V-shaped drill is not satisfactory for garden Peas, or that one should wait until mid-February to sow the first seeds. A piece of chicken wire of suitable height makes a good support for Peas where sticks are not procurable.

"Problems in Soil Microbiology." By D. W. Cutler and L. M. Crump. 8vo. 99 pp. (Longmans, Green, London, 1935.) 9s. net.

This little book is one of the well-known monographs on Agricultural Science published by the Rothamsted staff; it incorporates the substance of a series of lectures given at the University College of Wales, Aberystwyth, in which Sir John Russell, the Director of Rothamsted, has for long taken an active interest.

At the outset the authors consider the suitability of the soil for micro-organisms, pointing out that the pores between the crumbs of soil and the finer capillary spaces within the crumb form a suitable abode for bacteria and protozoa. Below the surface layer of the soil these free-living organisms are less liable to suffer violent fluctuations of temperature, they enjoy through the physical reactions of the water films on the smaller particles an almost complete immunity from total dessication, aeration is provided by the diurnal expansion and contraction of the gases in the larger spaces. So suitable is the environment for such forms of life that the general reader may perhaps be amazed at the density of the soil population. Great difficulties are encountered in the correct estimation of the numbers of bacteria and protozoa present at a given time. Fluctuations over wide ranges, daily and seasonally, occur; reliable estimates reveal that an ounce of soil may frequently contain nearly a thousand million bacteria, many million protozoa, and other numerous forms of life, including insects, round-worms, and also earth-worms. The authors consider some of the problems of technique concerned with bacterial counts and particularly with the statistical interpretation of such figures.

When the chemical activities of the soil bacteria are considered, it is seen that generally their source of food is the organic matter in the soil, the breaking down of which into simpler compounds precedes other changes. The interest of both the farmer and the gardener will at once be focused on those organisms that accomplish nitrification. It was once thought that the formation of nitrite in the soil was the particular work of one rather peculiar species, but now many strains have been shown by these authors to be most intimately concerned with such processes.

Moreover, the versatility shown by free-living bacteria is further illustrated by the behaviour of some of the ammonifying group of bacteria which may, under special conditions, oxidize the ammonia they form to nitrite, and under suitable circumstances consume their own nitrite product. Such adaptability is not confined to bacteria influencing the nitrogen cycle, but others are capable of decomposing a wide range of carbon compounds including sugars and organic salts. This versatility and adaptability affords problems of a physiological nature briefly outlined and touched upon by the authors.

With the protozoa also the authors have studied problems concerned with the effect of the density of the population on the rate of growth, and problems concerned with the fluctuation in bacterial food available. Other investigations dealt with concern the influence of temperature and soil conditions of moisture and the number of surviving protozoa. A moisture content of $\frac{1}{4}$ or $\frac{1}{2}$ of the water-holding capacity of the soil forms the lower limit at which protozoan life is actively sustained. Lower temperatures in the soil favour these organisms, which can also persist through gradual changes of the soil reaction from alkalinity towards acidity.

The latter part of the book is concerned with the interaction of the organisms in the soils—such topics as partial soil sterilization will prove of horticultural interest. This treatment of the soil results in the killing of a large number of predatory amœboid forms and a subsequent prolific development of bacteria upon which the former feed. This results in temporary increased fertility.

Finally, the efficiency of the bacterial mechanism in its relation to the number present affords problems for study which may find their ultimate solution upon physico-chemical lines. The removal of the end product of a reaction is well known to result in an acceleration of its formation, and it is seen that the action of protozoa in reducing bacterial numbers increases the efficiency of the survivors, maintaining it at its maximum. Such are some of the problems of the microcosm

of the soil crumb, frequently strikingly analogous to those presented by higher organisms in a larger sphere of activity.

This little book clearly presents the biologist's difficulties, such as those of interpreting his estimation of bacteria, and also the fascination he feels in the work of elucidating the activities of such simple yet all-important organisms. It is a clearly written account that can be appreciated without much technical knowledge. The general text is free from small errors, the list of references to original papers, though limited, is useful, and the brief index adequate. But the price is high.

M. A. H. TINCKER.

"Garden Magic." By Muriel Marston. 8vo. xii + 237 pp. (Methuen, London, 1934.) 7s. 6d.

The author is candid. "So far as gardening is concerned this book is neither informative nor coherent. It is, as well, discursive to the last degree. There are in it all sorts of things which no single-minded gardener would tolerate" (p. vii).

And the author is also modest. For there is not a little wisdom as well as not a little entertainment to be found in this book. One will not go to it for recipes. One may safely go to it to learn the characters of many garden plants, and perhaps also to catch something of that spirit which informs many a modest garden and makes it a place of quiet delight. But the reader must be prepared for "discussions" as he is warned.

"The Story of Gardening: from the Hanging Gardens of Babylon to the Hanging Gardens of New York." x + 475 pp. Large 8vo. (Routledge, London, 1934.) 15s. net.

Though bearing an English publisher's name, this book is written with an eye to developments in American gardening rather than to gardening in England. The roots of both, though, ramify through the ages of the past and bring material in varying degrees to nourish the foliage and fruit of the tree, which is the gardening of the present.

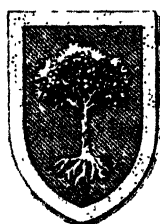
It is interesting to compare the nature of the fallen branches and twigs and the old foliage with that of the present day, and to see that as that tree has grown and taken more ground for itself the fashion of its leaves and branches have become modified, while keeping the same general form with which it started.

Much has been written in many books on the growth and development of gardening, and there is much repetition both of matter and illustration, as is only natural, since the sources of both are limited and fresh discoveries are rare, but in this present book the story is woven skilfully, and a very readable and interesting volume is the result.

The author has gone to almost every civilization for matter for his book, and has endeavoured to show the influence of migration and conquest, expanding commerce and exploration on the garden of its time. Many of his speculations into probable origins of types of gardens and the like are very entertaining, though—possibly because so much reliance has to be placed upon literature, and that so often lags behind performance—some of these speculations cannot be regarded as certainties. An instance is seen in the account of allotments—types of gardens intimately bound up with the administration of the manor, the common fields and the enclosures which came about in time which, at any rate in England, were themselves not a little related to the cultivation of the turnip and the keeping of sheep—this perhaps the author has had no opportunity of realizing. But never mind; he has skimmed the cream of many books and frozen it in a comely form for us to eat and digest at our leisure.

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ERICACEOUS PLANTS.

By Dr. FRED STOKER, F.L.S.

[Read September 10, 1935; Mr. F. J. HANBURY, F.L.S., V.M.H., in the Chair]

THE talk which I am about to inflict upon you is set down in the syllabus as a lecture upon Ericaceous Plants, but on the placards as on their cultivation. It appears necessary, therefore, to combine these two different subjects; but not in the form of a lecture. That is altogether too dignified and pompous a description of what I have to say.

To fulfil the promise implied by the title "Ericaceous Plants" would necessitate my talking until the late spring of 1936. It is necessary, from humane motives alone, to draw a line, and I propose to draw it after saying something about the attractiveness of the Family as a whole, its astonishing ubiquity in the wild, and the behaviour and value of certain of its members in cultivation.

Attractiveness is a curious quality. To be so endowed, an object must possess, in addition to the superficial graces, something which stimulates interest and awakens imagination. Consider the claims of the Ericaceae to this distinction. With the exception of the great desert areas there are but few places the eye of Heaven visits which do not nourish one or more examples of the race. The rigours of the Arctic are as acceptable to some as a steaming tropical heat to others. Tiny Rhododendrons endure a Himalayan altitude of 18,000 feet with the same cheerful spirit which supports the Cranberry through its long life in the bogs of Greenland and Kamtschatka. Cape Horn's unkind and wind-swept shores maintain *Pernettya* species, and the arid Pine

Barrens of the Eastern United States no more discourage that tricky little plant, *Epigaea repens*, than does the blaze of a South African sun devitalize the glorious Heaths which are peculiar to that country.

One might well suppose that these many and varied habitats must possess *some* factor in common to propitiate so conspicuously exclusive a Family. If there be such, I cannot say what it is. Even the reaction of the soil, our usual refuge in times of doubt, will not avail here, for, although the great bulk of Ericaceae are found in lime-free soils, certain noteworthy exceptions tolerate a limy environment remarkably well. The catholicity of taste displayed by the Family as a whole is shared by many of its generic groups. Some Rhododendrons, notably *Rhododendron calciphilum*, regard natural limestone with considerable equanimity, but to the great majority of its brethren lime is an abomination. Again, the European *Arbutus Unedo*, if not a lime-lover, is certainly not a lime-hater; but the American *A. Menziesii* will have none of it. And so in relation to other elements of environment; *Gaultheria Shallon* will disregard a drought which will shrivel up its geographical associate *G. humifusa*; the difficult *Cassiope hypnoides* is the only species of its genus which really appreciates sunlight in cultivation, in spite of the fact that it occupies similar natural stations to the other species.

Fortunately for gardeners, species of the same genus which require particular conditions often carry an indicative label in the way of size, root-type, or, especially, of leaf-shape or texture. We may therefore say that diversities in shape may usually be laid at the door of their surroundings in Nature, for as environment in any one place is practically rigid, any compromise necessary to fit a plant to it must, broadly speaking, take place at the expense of the plant. If it is obstinate in the matter, only two courses remain open—flight or suicide: suicide, that is, by defiance of the inevitable.

Of all the environmental causes which affect a plant's form, the water factor exerts the greatest influence—not only the amount in the soil capable of assimilation, but also the quantity which may be lost to the atmosphere by transpiration. Throughout the vegetable world we find the most ingenious contrivances to prevent excessive loss where the necessity arises, and in no Family are more devices used towards that end than in the Ericaceae.

The terrific winds of the Arctic, which would dehydrate an unprotected plant in a few minutes, are almost powerless against the armature of the tight-lipped little heroine, *Cassiope lycopodioides*. Its tiny leaves so overlap each other, and so closely hug the stem that only a fraction of their surface is left exposed. The Phyllodoce, another circumpolar race, not only fold their leaves backwards to protect the evaporating surfaces, but, in addition, clothe those surfaces with hair. Different, but quite as effective measures are used by the South American Pernettyas to retain their moisture against the almost constant hurricanes of Cape Horn. The stomatal surface of their leaves is dressed with a thick skin and, further, the leaves themselves

are so closely arranged on the stems as practically to protect one another.

Apart from wind, the great evaporating agent is sun-heat. Such leaf modifications as highly reflecting surfaces, vertical instead of horizontal disposition, and curling to protect the stomata are employed by the plants to mitigate its effect.

Sufficient has already been said on the extent of territory inhabited by Ericaceae. I do not intend to pursue the subject, but ask you to contemplate for a moment the astonishing fact that the members of one Family, scattered literally from China to Peru and from the Arctic to Patagonia, can, for the most part, be grown out of doors in an English garden.

To be sure, they require suitable conditions, but these, in many parts of the country, are not onerous. The essential is a lime-free soil. We have seen that certain species are quite tolerant of a limy medium, but even these will do just as well, and probably better, in a limeless environment. Given such a medium, which is at the same time reasonably retentive of water and well drained, there is not the slightest need to dig in quantities of peat or leaf-mould to ensure the well-being of the plants. *Why* lime is inimical to Ericaceae as a whole I do not know. Many theories have been advanced to account for this undoubted fact, but at the moment they remain little more than theories. We must just accept the state of affairs.

I probably flatter myself, but it is just possible that one member of my audience is hoping to gather a hint on how to grow these plants in a limy medium. Alas! so far as general cultivation goes, there is nothing to be said. Indeed, had Eurystheus been anything of a gardener we may take it as certain that he would have added to the labours of Hercules the task of growing Ericaceous plants in calcareous soil; and even the crafty Hercules would have failed.

If, however, expense is a matter of minor consequence (which it usually is to the keen gardener) some shift may be made to grow a few of the many desirable dwarf species in a limy neighbourhood by insulating them from the surrounding soil. A way in which this can be carried out is by a modification of the raised-box method devised by Mr. FRED STERN. He built an oblong framework two and a half feet high with railway sleepers, filled the interior with a porous lime-free compost, and provided the erection with spraying stand-pipes which can be turned on whenever necessary. The last item is difficult of introduction without a main-supply of water, and, moreover, is not necessary if the structure is laid on, but not attached to, a concrete base, and bottomed with 6 inches of crocks or other drainage material. Considerable diligence with the watering-can will be necessary in dry weather, but the danger of lime-charged soil-water being brought to the surface in times of drought need not be apprehended. A word may be said here on the nature of the water usable. Rain-water is preferable, but it is not always easy to store a sufficient supply. Hard water has been associated with many disasters, and it is, I believe,

the temporary hardness, that due to the presence of calcium bicarbonate, which is responsible. Some eighteen months ago I subjected various sensitive Ericaceae in pots to waters of different degrees of hardness, and found that water having no more than 14.5 degrees of temporary hardness was as harmless as rain-water itself. To return to the lime-free box: It is well to place it in shade. There will be less evaporation in such a position, and therefore less need for watering; besides, few of its future occupants suffer sun gladly.

There are so many delightful plants in the Family that, in the making out of a list for general garden purposes, it is very difficult to decide what to include and what to omit. Let us suppose that the garden about to receive them is only of moderate size; an acre or two, perhaps, or even less. It will be wise to exclude the large Rhododendrons, those of the type of *R. sino-grande*, *R. arboreum*, *R. barbatum*, and *R. campanulatum*. They really have no place in a small domain; in addition to the space required they are by no means easy to please away from the company of tall and shade-giving trees and without a generous rainfall; and, if they *do* smile upon our efforts, we are at once enslaved and plant their like in every corner, available or otherwise. This would never do; there are other plants besides tree Rhododendrons. The dwarf or alpine species, however, represent a very different pair of shoes. One square foot will accommodate quite a sizeable specimen, and most of them are so tractable, so floriferous, and so free from the common ills that plants are heir to that we are justified in spreading ourselves a little in their direction; to the extent indeed of purchasing three or five of a kind in order that mass effect may be obtained. Rhododendrons are among the many plants which should be chosen while in bloom. I refer to individuals. It is said of a popular beverage that "all beer is good, but some is better than others." This experienced observation might, with a little remodelling of the syntax, be truthfully applied to unnamed forms of Rhododendron species. *R. calostrosum*, for example, may be only a few inches high, dressed in silvery foliage and covered at the proper season with large flowers of luminous rosy-purple. On the other hand, a certain sober gawkiness tempered with magenta may be its general effect. But, while selecting forms, do not allow the dazzlement of colour to paralyse entirely your critical faculties. Visualize the appearance of the plants in the "dead season"; scrutinize their foliage and their habit; will these hold your interest when the time of blooming is past? Further, while the opportunity is yours, observe the conditions under which they are growing: the soil, the drainage, the shade given from neighbouring plants, and also the area occupied by adult specimens.

R. repens is, in the opinion of many, the most superbly beautiful dwarf Rhododendron in cultivation; when, that is to say, it flowers. But a garden requires the special blessing of Ceres before that event can happen. And the goddess is chary of her benedictions. At all events, they do not descend upon my garden, however much I use

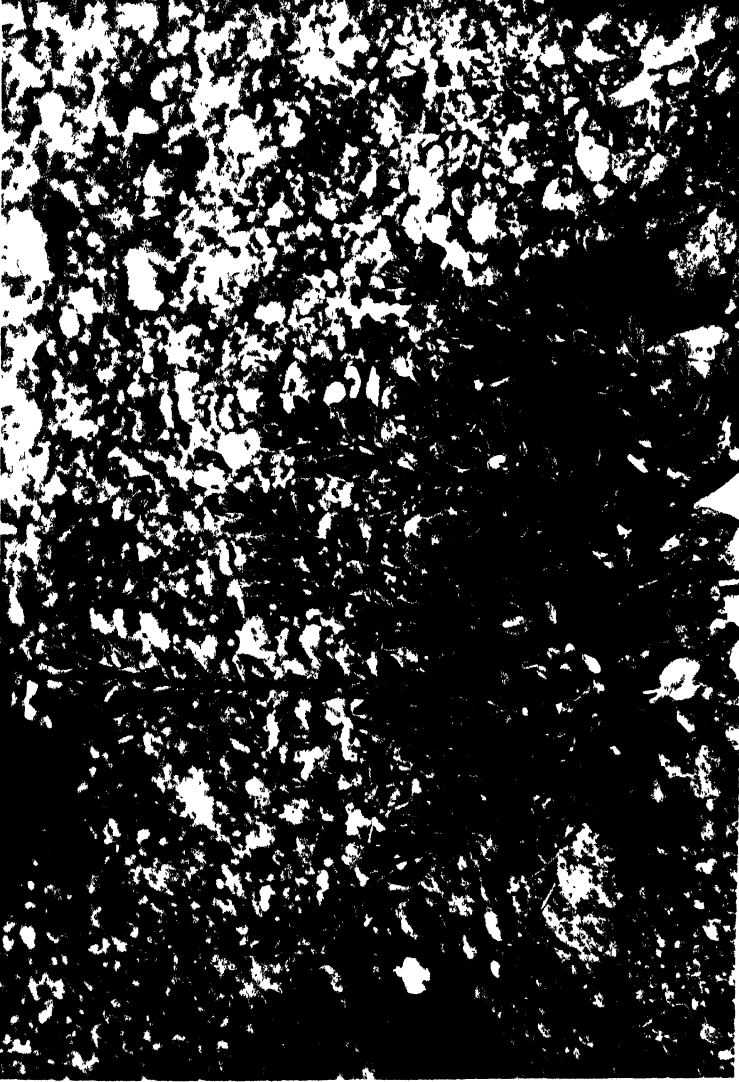


FIG. 151 RHODODENDRON RACEMOSUM
Three months after pruning to ground.



FIG. 152. HEATH GARDEN AT THE SUMMIT, LOUGHBOROUGH

my feeble blandishments. Its flowerlessness, indeed, bids fair to sap my regard for *R. repens*. In fairness, though, it must be recorded that my dozen or so plants produced amongst them one blind flower during the past spring. But one calyx does not make a summer. Whatever your chosen dwarf Rhododendrons be, endeavour to include these three comparatively recent introductions: *R. imperator*, *R. pema-koense* and *R. crebreflorum*, especially the last. It is quite hardy, very dwarf and bears dense heads of flowers, usually pink, which are distinctly reminiscent of those of *Daphne petraea grandiflora*. You may have noticed that if a plant bears a semblance to an old and honoured favourite, so much the greater is its measure of attraction. Another illustration of this reflected glory, so to speak, lies in the brown-pink campanulate blooms of the seductive *Rhododendron myrtilloides*. I need not recall to you the familiar charms of *R. impeditum*, *R. radicans*, *R. keleticum*, *R. cantabile*, and other jewels of the genus. Besides, they lose nothing by their descriptions in any catalogue.

It has been whispered by slanderous tongues that botanists do not invariably have their being in that atmosphere of harmony one associates with a choir of angels. And, indeed, there seems no doubt that the taxonomic position of *R. kamtschaticum* has proved a bone of contention more than once. The forces of disaffection have gone so far as to offer up its generic name on the altar of the great god Nomenclature, and substitute the merciless *Therorhodon* in its place. Happily, the plant has disregarded the infliction, and remains much the same as ever. Discovered and described by the illustrious PETER SIMON PALLAS who, at the command of CATHERINE THE GREAT, investigated the flora of European and Asiatic Russia 150 years ago, it seems odd that the shrub is not more widely known. In addition to its own essential qualities it reminds us of a side of CATHERINE's character less known than those generally advertised. Native to the extreme north-east of the Asiatic mainland, sending outposts to the Commander Isles in the Behring Sea and others to the Kuriles in the North Pacific, the plant is of such hardihood that the enervating atmosphere of an English garden is often more than it can bear. Moisture in the growing season and an artificial drought brought about by a Chase cloche in winter will, nevertheless, moderate its prejudice.

One more word on Rhododendrons. Many of them—for instance, *R. racemosum*, *R. scintillans*, *R. russatum*, *R. riparium* and similar species—tend to become leggy in the course of years. No hesitation need be felt about cutting them back to within an inch or so of the ground immediately after flowering. This photograph of *R. racemosum* (fig. 151), taken two and a half months after the operation, demonstrates their regenerative faculty.

For massed colour-effect the Heaths excel even Rhododendrons, particularly in the drier parts of the country. Their many excellent attributes have been described times out of number, and a selection of species and varieties may well be left to your own discrimination

and a catalogue. There are only one or two suggestions I have to offer. If the soil is very dry, as in positions impoverished by Elms or Birches, South European species such as *Erica stricta*, *E. carnea*, *E. arborea*, *E. australis* and *E. lusitanica* will be found more tolerant of it than the more northern members of the genus. The latter should be planted in large groups, and a rolling moorland imitated as far as possible (fig. 152). To break the flatness a Scots Pine or a bank of double-flowering Gorse or tall Genista may be introduced here and there, but no jerkiness should be allowed to enter the picture. There is no reason why allied shrubs should not also have a place on your moor, particularly those which are found associated with Heaths in nature. The beautiful Bog Rosemary's silvery leaves and drooping bells of softest pink "go with" any of the Heaths, and the plant will tolerate a much greater degree of drought than is commonly supposed. *Daboecia polifolia*, also patient of a dry soil, is another appropriate companion, and may "be had" in white, purple, mauve, and with flowers of both white and purple on the same plant. Should there be a dampish spot, *Vaccinium Vitis-Idaea* will quickly furnish it. Do not be contemptuous of this shrub's modest appearance. It is the reticence of ancient greatness. Esteemed in Troy for the flavour of the wine made from its fruit, it was named the Alexandrian Vine. Not, mark you, to exalt the plant, but to honour ALEXANDER who, it appears, granted the city certain privileges about the year 334 B.C. PLINY, some 400 years later, wrote down that its juice, together with that of the Bilberry, was used to dye the garments of bond-slaves. A little falling from eminence is evident here, but nothing in comparison to the degradation now fallen upon the plant, and expressed in its popular name of Cowberry. It is a far jump from the Vine of Alexander to the Berry of the Cow. Some serious penalty, something with boiling oil in it, should be inflicted upon the perpetrators of such names. Fortunately, we can forget the term Cowberry, and adhere to the much more gracious English rendering of the Latin name, and speak of the shrub as the Vine of Mount Ida.

The very lovely rose-pink form of *Kalmia latifolia* will fully justify a place near the edge of the moor, whilst the more diffident but equally beautiful *K. angustifolia* var. *nana* will glorify a slightly wetter area.

In common with many other Ericaceae, Heaths enjoy the close neighbourhood of their fellows, and also of certain other genera in the Family. It is astonishing how they will fling themselves against a tall *Vaccinium*, for instance, as if to crowd it out of existence. But the *Vaccinium* welcomes the invaders, and thrives amid their multitude. The most popular of the Phyllodoces, *Phyllodoce empetriformis*, will gladly establish itself in a shady part of the Heath garden. On its behalf, however, we must curb the eager yearning of the Ericas. Give them their way, and they will verily smother the less vigorous object of their affections. There may, as some aver, be a touch of Othello in their psychology, but I doubt it. They are rather the plant counterparts of a cat I once possessed. Dinky was a male with strong maternal propensities. Could he find a kitten, a puppy or even a

young tortoise to mother, he washed and tidied-up the little creature at all hours of the day and night. The tortoise was reasonably complacent, I remember, but the other feebly struggling foster-children, the metaphorical *Phyllodoce*s, had to be rescued from his enthusiastic attentions.

One of the daintiest treasures of Japan is *Phyllodoce nipponica* (fig. 153). The radiant whiteness of its pendent bells, occasionally tipped with pink, and held on stems of exquisite fragility, give a totally false impression of weakness. It is actually as hardy as a battleship and will rapidly increase, not, it is true, within the embrace of ardent Heaths, but in a moist, well-drained pocket in a sandstone rock-garden. Pockets, by the way, to answer their familiar use, must be well and truly bottomed; in the rock-garden, on the other hand, they should be bottomless.

A very proper neighbour for *P. nipponica* is the comely bi-generic hybrid *Phyllothamnus erectus*, the child, so report has it, of *Phyllodoce empetriiformis* and *Rhodothamnus Chamaecistus*. Having the good qualities of both patrician parents and none of the whimsies of *Rhodothamnus*, it will give as much pleasure as anything in your garden. *Rhodothamnus Chamaecistus* itself compels the admiration even of the inhabitants of the countries in which it is wild. And that is saying a good deal. Its abounding magnificence in northern Italy, usually on exposed faces of the living rock, encourages the idea that it must be as easily cultivated as, for example, *Daphne Cneorum*. A few trials dispel that optimistic outlook. Vain do we find the advice of authorities who deal in limestone and full sun, and equally futile the recommendations of scree enthusiasts. There is, however, a prospect of success by using a sandstone pocket charged with porous, humous soil in half shade.

There is nothing of the miff, however, about *Pernettya mucronata*. Its fortitude is that of the gallant men associated with its name, and with its place of origin: GAUDICHAUD-BEAUPRÉ, PERNETTY, BOUGAINVILLE, and the great MAGELLAN himself.

Although perhaps the best berrying dwarf shrub we have, it has the unfortunate reputation, more or less well-founded, of having a certain reluctance to fruit in many places. Many explanations have been advanced to account for this disappointing behaviour, but we remain as wise as ever. It is impossible to believe that there are male and female plants and that their association is necessary in order to secure fertilization; the structure of the flowers negatives such an idea. Nor is it easy to credit that some plants function as males and others as females. Biologically considered, *P. mucronata* scarcely needs to fruit, so easily does it perpetuate itself by means of runners. If this suggestion touches the cause of its relative sterility, then poor soil and full sun should do something to correct it. From what I have seen, I am inclined to think that town air discourages its fruitfulness, and it seems possible that *P. mucronata* may detect some difference between the stormy winds of the Straits of Magellan and, for example, the conventional atmosphere of Tooting Bec.

P. leucocarpa is almost a smaller replica of *P. mucronata*, and equally handsome in fruit. In spite of its name, the berries are by no means invariably white; red and pink fruits are quite commonly seen. In common with the other South American species in cultivation, it is best in a dry, sunny position. On the other hand, *P. tasmanica* appreciates a little shade and, from all accounts, some little protection in the colder counties. Nothing like so useful or attractive as its South American sisters, it is, nevertheless, a desirable little prostrate and red-fruited evergreen, and much less invasive than they. The latter, incidentally, should have a bed to themselves. Give them an inch, and the proverbial ell will set no limit to their aggressiveness.

The Gaultherias are also principally grown on account of their brilliant fruits. A small collection might well include the North American *Gaultheria procumbens* with red berries, the tiny-leaved New Zealander *G. depressa* with disproportionately large crimson ones, the Japanese *G. adenotheix* and *G. Miqueliana* befruited in red and white respectively, the noble Chinese *G. Veitchiana* which bears capsules of indigo blue, and the two Himalayans *G. pyrolaeifolia* and *G. trichophylla*. The first of the last two increases rapidly by stolons, is quite prostrate and carries red berries almost as large as wild cherries, while *G. trichophylla* owes it fame to large and handsome pale blue fruits. With the exception of the last-named species, none of those mentioned presents the slightest difficulty in cultivation. They all require a lime-free soil, and enjoy a measure of shade, though both *G. procumbens* and *G. Veitchiana* will thrive amazingly in sun. But *G. trichophylla* is a problem in many gardens. A moraine plant in Nature, and drenched with the torrential rains of the monsoon during its growing period, we may suppose that its frequent miffiness is due to insufficient moisture. At all events, my own experience of the plant was very unsatisfactory until it was planted in a shallow scree and never allowed to experience drought. In parenthesis, many of the more difficult Himalayan plants, for example *Primula Wollastonii*, *Cyananthus* sp. and *Gentiana ornata*, never showed me the slightest encouragement until they were given similar conditions.

I hesitate to apply the word "indispensable" to any plant. It means less than it conveys. Possibly the information, early impressed upon me, that the one indispensable person attached to the Hospital which fostered my student days was the Hall Porter has debased its grandeur. Therefore, instead of characterizing certain *Vacciniums* as indispensable, let us put it that they are to be desired. The genus contains an enormous number of species, but if our selection was limited to five, then *Vaccinium glauco-album*, *V. Mortinia* (fig. 154), *V. Nummularia* (fig. 155), *V. padifolium* and *V. virgatum*, or, instead of the last, *V. pennsylvanicum* would both do it justice and give it variety. Time will not permit of their detailed description; sufficient at the moment to say that their every part and quality are admirable. *V. Mortinia* is native to the Andes of Ecuador. Its fruit is vended in the market-place of Quito. One might suppose that its equatorial habitat, even at an

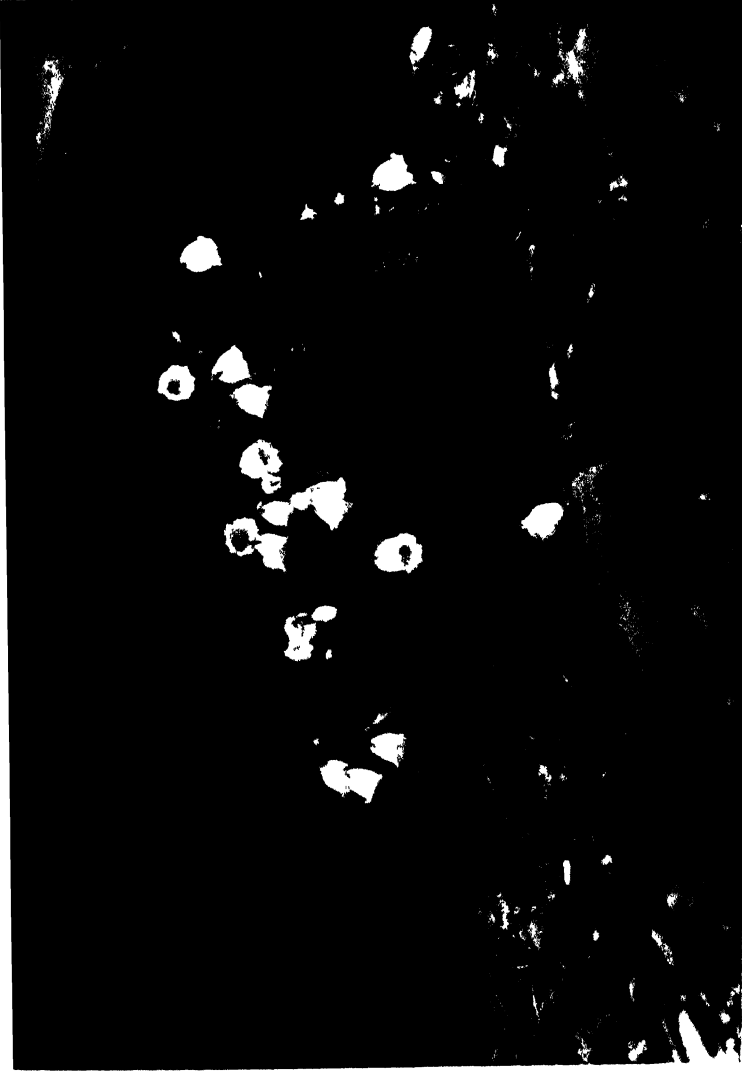


Fig. 153 - *Phyllodoce nipponica*.

Jo. fac. p. 480.



FIG. 154. *VACCINIUM MORISONII*



FIG. 155 *VACCINIUM NUMMULARIA*

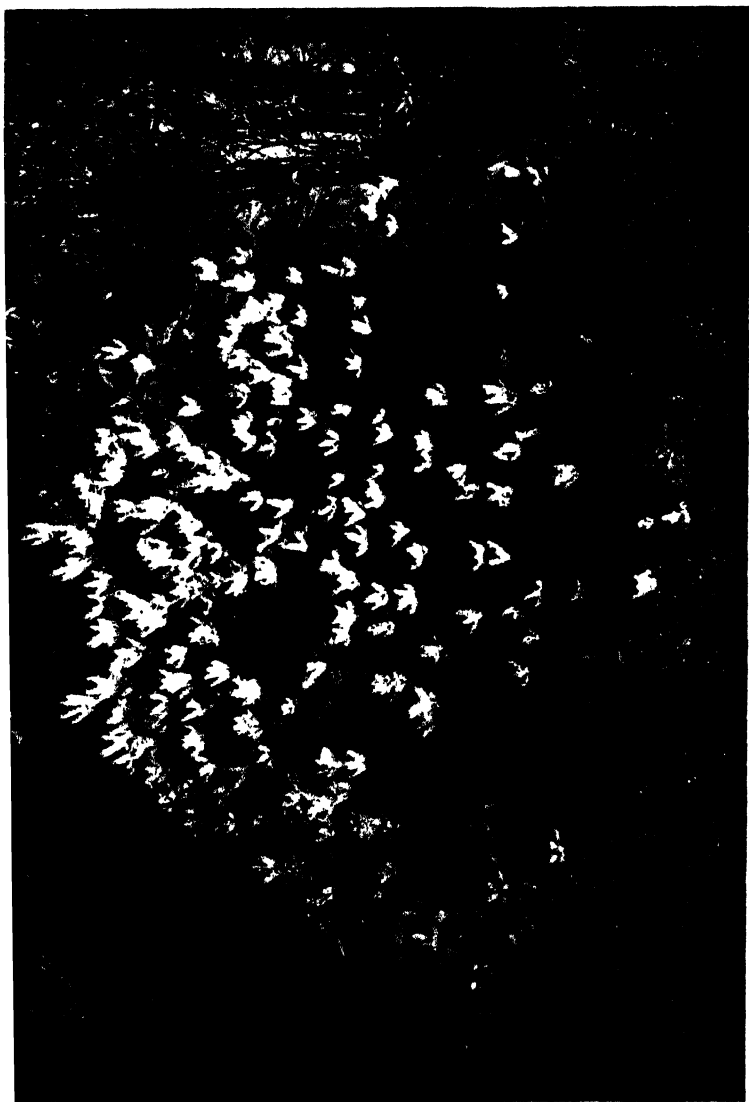


FIG. 156. - *PIERIS FLORIBUNDA*

To face p. 481.

altitude of 10,000 feet, would endow it with a somewhat tender habit, but I have not noticed any lack of resistance to, at any rate, Essex frosts. The plant shown is facing north-east. *V. Nummularia*, most delightful of the dwarfs, is unfortunately not so complacent. The tips of the branches are apt to be cut by even a moderate frost. As years go on, however, the shrub apparently acquires a stronger quality, and plants raised from seed ripened outdoors in this country have a measure of hardiness far in excess of that which marks those grown from wild seed. All the species mentioned are easily grown in pleasantly moist and lime-free soil; a little shade is perhaps advisable for *V. glauco-album* and *V. Nummularia*.

Dwarf shrubs have occupied our attention almost exclusively up to this moment. I fancy I can feel a question in the air asking if I know of no taller species, but of a size suitable for the garden we originally postulated. *V. padifolium*, the Madeiran Whortleberry, lifts us out of the rut. It reaches some eight feet in height and not much less in width. It is evergreen, bears a profusion of large pink and white bell-shaped flowers in spring and a bountiful crop of blue-black berries in the autumn. The fruit is edible and has a better flavour than our native Bilberry. I have often wondered, indeed, why the shrub is not cultivated for the sake of its fruit. *Pieris* also gives us species which cannot be looked upon as dwarfs. The most generally known, and possibly the hardiest of the genus, is *Pieris floribunda* (fig. 156) from the mountains of Virginia. You have all probably remarked that there are plants both interesting and ornamental which make no strong appeal. That is the relationship between *Pieris floribunda* and myself. A neat, evergreen bush, peculiar in carrying its racemes of flowers erect, very floriferous and good-natured, but, to my rude eye, with a quality of chilly self-righteousness about it. Very different is the effect of *P. japonica* with its hanging panicles and graceful droop of branch. Quite hardy, entirely reliable and not in the least exacting, it may justly be ranked as one of the best Ericaceous shrubs in cultivation. More magnificent, but, alas! less hardy is *P. Forrestii* whose brilliant scarlet new foliage, massive panicles of fragrant flowers and shining evergreen foliage are gifts not given to every plant.

Closely allied to *Pieris* is the monotypic genus *Arcterica* which, by reason of its representative *Arcterica nana*, must by no means be overlooked. Discovered and first described by the Russian botanist MAXIMOWICZ under the name *Andromeda nana* in 1873, it was not introduced into gardens until as recently as 1915. *Arcterica nana* (fig. 157) is a tiny, prostrate, evergreen shrub which covers itself with creamy-white urn-shaped flowers in spring and again in autumn. A native of north-eastern Asia and northern Japan, it is as hardy as one can ask; even the moist melancholy of an English winter leaves it undepressed.

Another related genus, and, curiously enough, also monotypic, is that of *Zenobia*. The type species, *Zenobia speciosa*, glorious plant though it be, is outshone by the variety *pulverulenta*. Both type and variety

exhibit handsome racemes of coldly white, open-campanulate flowers drooping from the overburdened shoots in June, but the blue-white leaves and young stems of the latter give it a beauty attained by few shrubs, ericaceous or otherwise. *Zenobia* increases rapidly by shoots from the base, and requires an annual thinning out of old wood to maintain its full floriferousness.

It is very singular why the taller *Arctostaphylos* are so seldom seen in cultivation. One has heard terrifying tales of their suddenly "going off," breaking at the neck, and other outrageous conduct, but I have seen none of these things, though perhaps an acquaintanceship of but twelve years is too short to lend my experience any value. Be that as it may, for a plant to be a source of constant interest for twelve years is no small recommendation.

This is *Arctostaphylos Manzanita*. It attains some 10 feet in height in cultivation, has thick, glaucous and vertically-held leaves, panicles of pink and white flowers in early spring and, excellent quality, a bark like old mahogany, and as smooth. The name of this shrub consists of words from different languages, and, as is not uncommon in such circumstances, presents something of a contradiction. It means, in short, "Bear-grapes like little apples," both components of the name having a reference to the fruit.

A. tomentosa is a slightly dwarfer and more spreading plant, with bluish green, downy foliage, similar flowers to the previous species, a dark red, smooth bark and a stem and branch arrangement of wonderful design.

Both these species should be protected from strong winds; their wood is rather brittle.

The genus *Arbutus*, though not a large one, excels in beautiful barks. Regard, for example, *Arbutus Menziesii*, native to the Pacific coast of North America. I am indebted to Mr. JOHN DEAN of British Columbia for this picture (fig. 158) of a tree 75 feet high, but hasten to add that there is little danger of the species reaching such a height in this country.

A. Andrachne is native to northern Asia Minor and is, at the moment, hard to obtain, but the natural hybrid between it and *A. Unedo* named *A. andrachnoides* or *A. hybrida* presents no such difficulty, and, endowed by *A. Andrachne* with a bark of terra-cotta, is an extremely handsome plant. Our old friend *A. Unedo* has nothing in the way of bark to recommend it, but an annual liberality of strawberry-like fruits has brought it a popularity which needs no emphasis from me.

I must express my deep sense of obligation to Messrs. Malby, who have been at infinite pains to satisfy the exacting demands of a pernickety client. They made all the lantern slides I have shown, and took the original photographs from which the illustrations were prepared with the single exception of that of *Arbutus Menziesii*.

NEW HERBACEOUS PLANTS.

By BEN WELLS.

Read August 27, 1935 ; Dr. F. STOKER, F.L.S., in the Chair.]

To lessen confusion for lecturer and listener alike in dealing with a rather extensive subject, I propose to divide the lecture into two parts, devoting the first to species and the second to plants of garden origin.

With regard to new herbaceous species, it might be well to mention that, whilst the collection of shrubs, annuals and Alpine plants in this country has greatly benefited through the medium of plant-hunting expeditions which have been carried out in many parts of the world, it is to be regretted that not many herbaceous perennial plants in the true sense of the word—that is to say, useful material for our herbaceous borders—have been introduced. There is another point which must be appreciated, and that is the comparative ease with which the average herbaceous plant, whether new or old, species or hybrid, can be propagated in this country. It might not be out of place to mention here that the fact that stocks of new plants are very quickly available in quantity is due largely to the enterprise of the too often maligned nurseryman. Maybe his motives are mercenary rather than philanthropic in giving enthusiasts the pleasure of enjoying the delights of a new plant, but, nevertheless, it means that a new plant rapidly becomes old from the point of view of one dealing with the subject of “new herbaceous plants.”

Dealing with the new species in alphabetical order, *Anthemis Sancta-Johannis*, recently introduced from Albania, may well take first place. Its bright orange flowers are produced throughout the whole summer season. This propensity for long blooming and its value as a cut flower make it an exceedingly worthy addition to the border.

Anemone tetrasepala (fig. 159), a newcomer from Kashmir, when established becomes a giant among Anemones. It resembles its cousin, *A. japonica*, in parts and habit : its flowers are white but somewhat smaller and are produced in magnificent cluster heads. It likes shade.

In *Achillea clypeolata* we have a dwarf edition of that useful herbaceous plant *A. eupatoria*. The finely cut foliage is grey-green and the flower-heads of bright yellow are in flat clusters on erect stems of 18 inches.

To all lovers of fine delicate grace, *Aquilegia longissima*, as a newcomer, must appeal. The flowers are of a pleasing yellow, but its claim to distinction lies in its tapering daddy-longleg-like spurs, 6 inches long, which give it unique charm.

Dicentra glauca (fig. 160), although known in its native America for some time, is a comparative newcomer to this country. The pink-tipped cream flowers are borne on pendulous stems arising from dense tufts of glaucous maidenhair-like foliage.

Dracocephalum sp. K.W. 10640, a recently introduced plant from the Himalaya, is eminently suited to the forefront of the herbaceous border. Its low spreading masses of bright green, surmounted by tufted spikes of creamy white flowers, make it both beautiful and useful.

Eriogonum niveum has a freely branching inflorescence. The branchlets, which are themselves clothed with silvery sheen, are studded with dainty pink flowers, a very beautiful combination.

For those who can find a site in a warm south border or against a south wall, *Iris japonica*, Ledger's variety, is an admirable plant. The flat, open, white velvety butterflies with beautiful purple and gold markings place this in the very front rank of garden beauties within the reach of all.

Of exceeding grace with an abundance of bright lavender-blue flowers produced on erect and sturdy branching stems is *Linum hirsutum*. Any new species of the justly popular Flaxes will be welcomed by all garden lovers, especially as this particular one adds height to its claims to popularity.

Meconopsis.—Very valuable additions to the herbaceous border, and particularly the shady border, have been made during recent years by the advent into this country, mainly from the Himalaya, of various species of *Meconopsis*. Everybody knows the value of *M. betonicifolia*, which has become such a universal favourite.

The utility of *Meconopsis* in the border not only depends upon the beauty of their colour in flower but also upon the equally attractive deeply cut foliage of silver-green, gold and even bronze clustered leafy crowns which adorn the bare ground of winter. Of the individuals, *M. regia* with its luscious crown of golden hairy leafage and yellow flowers is perhaps the most noble, whilst *M. paniculata*, with its tall yellow pyramid tapering 7 feet, is the most statuesque. Of the others, *M. integrifolia*—aptly described as the Lampshade Poppy—with its hairy stems supporting a yellow crinkled umbrella, vies in loveliness with its taller, sky-blue cousin, *M. betonicifolia*. Then comes *M. Dhwojii* with its severely slashed and lacerated foliage and thistle-like hairs of shimmering bronze but disappointing small, nondescript yellow flowers. And, beware! it has bigamous tendencies and will hybridize with every other *Meconopsis* in your garden. This would possibly be an advantage if its progeny turned out to be a little less nondescript than itself. Such is not the case and plants bearing miffy, washy flowers result. And lastly, *M. quintuplinervia*—FARRER'S Harebell Poppy: although his lavender-blue face is too often flushed an unattractive pink, he is a little fellow of exceeding grace and herein lies our affection for him. It was fitting that this—really accepted as a true perennial *Meconopsis* and regarded by FARRER as



FIG. 157 ARGEMONE NANA



FIG. 158 ARBUTUS MENZIESII.

[To face p. 485.]

the gem of the genus—should be chosen as a blue memorial planting on his solitary grave so many thousands of miles away.

A worthy rival to the well-known Catmint is *Nepeta nervosa*. It is darker in colour and sturdier in habit. Planted in conjunction with *Anthemis Sancta-Johannis* it makes a happy contrast combination, as they both have the same prolonged flowering period.

Nierembergia hippomanica.—Although I feel guilty of possibly stealing the thunder of one likely to include this plant in a lecture upon alpine plants, I think its suitability for and loveliness in the front of a border are ample justifications. This plant will provide a feast of loveliness 2 feet across from a single rootstock within twelve months of planting. The whole mass becomes spangled with pale purple-blue flowers like open saucers.

A good deal of confusion as to correct nomenclature exists in regard to *Oenotheras*. A comparative new one to me, however, and certainly one of the most distinct, is *Oenothera Bertolonii* (fig. 161). The purity of its yellow combined with its size of flower, long flowering season and sweet scent, go to make it a worthy border plant. It can be planted with advantage in an odd corner, where little or no attention can be given, to take care of itself.

Pentstemon Eatonii.—This tall aristocrat suspends elongated tubes of bright salmon-scarlet and successfully defies the competition of the softer shades in the border. Of a very different appearance but equal fascination is *P. procerus*, which, when planted *en masse*, produces a fine picture of bluish-purple. Both of these merit inclusion in a well-balanced mixed border.

Phlomis cashmirica.—For colour grouping the Jerusalem Sages are ever popular. This new species from Kashmir ably maintains its place amongst its better-known rivals. The pinkish-purple cluster heads of nettle-shaped flowers surmount drooping bracts in a peculiar and attractive manner.

Phlox argillacea, like all really good *Phlox* species, hails from America, and, as the name suggests, revels in heavy clay. It is a most attractive species near *P. pilosa*, and in the open border attains a height of about 15 inches. The glistening silvery-white flowers are most freely produced on erect branching stems.

Very difficult to describe in words is the appeal of *Roscoea Humeana* (fig. 162). Its nearest prototype is *R. cautilioides*, but the flowers of *R. Humeana* are of an ill-defined lilac-blue shade and the whole plant with its sword-like leaves much larger and bolder in habit and growth.

Rudbeckias have always been appreciated for their value in giving a colourful and bold appearance to the border, and in *Rudbeckia hirta* we have an addition which will in no way lighten the esteem in which the family is held. Like *R. Newmanii* in habit and growth, it is lavish in presenting its shades of yellow, gold, red, orange and mahogany star-shaped flowers on erect 2-foot stems.

Sphaeralcea acerifolia is another long known but only recently

grown plant. It is of the Mallow family, with a tall closely bloomed spike of white flushed pink saucers with Maple-like foliage. Another of the Mallow family only recently introduced is *Malva setosa*—this time a giant from the Balkans, where it towers in spikes of deep rose-pink but in this country varies from white to crimson.

In *Stokesia cyanea superba* we have a plant without the floppiness of its prototype, *S. cyanea*. In a curious symmetrical asymmetry this plant holds erect its lavender-blue flowers for all who will to see and admire.

Tradescantia reflexa, given a moist corner in partial shade, spreads its sheathed pale blue blossoms in no niggardly fashion. The reflexing of the leaves, which are of a shade approaching duck's-egg green, expose the flowers far more than in many of the more common garden hybrids of the virginica type.

A border without Mulleins can be likened to roast pork without apple sauce, and we are fortunate in having an addition to the many and stately varieties which already adorn our borders in a plant from Asia Minor named *Verbascum broussa*. Its bright yellow flowers are produced on 6-foot spires which, like the leaves, are literally covered with white down almost like cotton wool. It is an elegant plant and, although last, is certainly not the least meritorious of the species I have mentioned.

Leaving the species and passing on to hybrids and garden-raised varieties, *Aconitum Wilsoni*, Barker's variety, is well worthy of first mention, for of the border perennials presented to the Committees of the Royal Horticultural Society in 1934, few were received with greater acclamation than this Aconite of great merit. It towers to a height of 7 feet, and the stiff erect spires support lavender-blue flowers of great size.

Alstroemeria 'Dover Orange' (fig. 163) is a giant, deeper orange form of *A. aurantiaca*. This is indeed a vast improvement on the type and will no doubt, in course of time, oust its popular predecessor.

Of *Anchusa* 'Morning Glory' one need only say that it is indispensable to the garden—it supersedes all other varieties. Tall and stately, it produces a mass of brilliant electric blue such as few plants can. Another new *Anchusa* is the variety 'Stella,' which will have an appeal to those who have a leaning towards bi-coloured flowers.

Many and varied are the varieties of *Anthemis tinctoria* which have been placed on the market during recent years. Possibly the two most outstanding ones are *Anthemis tinctoria*, Perry's variety, which has golden-yellow flowers in great profusion, and *Anthemis tinctoria*, Merstham variety, the flowers of which are freely produced and are probably a little larger than those of other varieties. Both are invaluable plants. They assure a bright yellow splash in the border from June to August and their value as cut flowers must not be overlooked.

Extraordinary though it may seem when we already have in our borders Michaelmas Daisies of every hue, tall and short, dark and

fair, there are three new varieties which claim attention. They are 'Taplow Spire,' with heads of cerise-pink; 'Mammoth,' aptly named, as the individual flowers are larger than any Aster yet raised and which are of a deep lavender shade; and 'Jo'phine Wells,' which can be described as an improvement on 'Little Pink Lady.' All three are of the Novi-Belgii section and the first and last mentioned have quite a dazzling effect under artificial light.

There is a great future before the new dwarf-growing hybrids. They are dwarf counterparts of their taller brothers of the Novi-Belgii section. For ease of cultivation and free-flowering propensities they are unsurpassed. They grow to a height of 9 to 12 inches and are ideal plants for the front row of the herbaceous border. There are already several varieties, of which 'Blue Baby,' with double flowers of bright blue; 'Marjorie,' bright rose-pink; 'Nancy,' pale pink; and 'Victor,' with flowers similar to those of Aster 'Climax,' can be recommended.

Although *Astilbe* 'William Reeves' received the A.M. of the R.H.S. in 1930, it may still be considered a new plant. In any case, it has not yet been superseded. Its spikes of rich deep crimson are valuable in so many positions in the garden.

Campanula grandis, Highcliffe variety, is an exceedingly fine form of *C. grandis*. Of a pleasing shade of deep blue, it is a wonderful plant to produce a mass of bold and useful colour.

One or two hybrids of Catananche have come to the fore recently: 'Perry's White,' a much improved form of the ordinary *C. alba*, and *C. coerulea major*, much larger in flower and a deeper shade of blue. Well-established plants of these varieties will always be welcome as they are so floriferous.

How often one hears remarks to the effect that double flowers and white flowers are not appreciated. It will be interesting to hear what the perpetrators of these remarks have to say regarding *Chrysanthemum maximum* 'Esther Read' when it is brought to their notice, for this particular variety is both white and double and, without doubt, is one of the most valuable herbaceous plants which has been introduced for several years. It commences to bloom in the very early summer and goes on and on until autumn. The pure white, very double flowers are borne on stiff stems, making it an invaluable plant for cut flowers.

I arrive at Delphiniums with some trepidation. The difficulty here is not to select the good new ones but to endeavour to eliminate those which are less good. Convention demands that ladies should come first, and of these august personages 'Lady Eleanor,' in my opinion, takes precedence. Her regal spike of sky-blue, double flowers exquisitely suffused with pale mauve, sets her apart. Then comes her sister, 'Lady Edith,' somewhat shorter of stature, with semi-double lavender flowers from the centres of which her dark eyes peep. 'Lady Elizabeth,' another semi-double, this time a delightful shade of lavender on blue, has her flowers regularly spaced

on a 5-foot spire. Then comes 'Lady Clara,' with a massive pyramidal spike of deep mauve self flowers which are of excellent form and substance. The last of the titled mannequins is 'Lady Guinevere,' with her sky-blue gown and entrancing glad white eye. So much for the ladies of rank. Of the untitled ones 'Laura Fairbrother' overshadows her more exalted relations by producing a spike of loveliness $7\frac{1}{2}$ feet high; $3\frac{1}{2}$ feet of this glorious spire is enveloped in delicious mauve semi-double flowers each having a small white eye. 'Robbie,' from his exquisite form, grace and delicate colouring, should certainly have been a lady, but possibly his distinct appearance places him in the other gender. He has light, silvery-blue semi-double flowers, with an attractive black eye regularly striped with mauve. 'Wild Wales' and 'Wrexham Dandy Boy' are two more excellent new varieties, the former having large single flowers of amparo-blue set up on a 4-foot tapering inflorescence. It is a strong, vigorous grower. The latter is also a variety with single flowers; they are of mazarine-blue, with light mauve edges to each petal. It will become popular as an exhibition variety, for it has exceedingly valuable lasting qualities in flower. To the fastidious, any attempt to divorce the stately *Delphinium* from its inherent blue may not meet with approval, but a praiseworthy endeavour over a long period has resulted in *Delphinium* \times *Ruysii* (fig. 164). This is a pink *Delphinium* of the Belladonna type, and is the result of a cross between *D. nudicaule* and *D. elatior*. But in spite of the remarkable success of a nurseryman's art, one cannot but recall and endorse A. A. Milne's "Geraniums red—Delphiniums blue."

Gaillardia 'Firebrand' is a very worthy addition to our borders. It is tall growing, has large orange flowers, and is most useful for cutting. A particularly sturdy variety with longer and stronger stalks than the average is *Geum* 'Prince of Orange.' It is of a true rich orange shade and will no doubt attain a similar popularity to that of the well-known favourites 'Mrs. Bradshaw' and 'Lady Stratheden.' It has an advantage in that it reproduces itself true from seed.

Great strides have been made in the improvement of the old *Heliopsis scabra*, and the latest and undoubtedly the best is *Heliopsis incomparabilis*. It has large, many-petalled, deep rich golden orange flowers on stiff erect stems. It gives a great show in the border and is most useful for cutting.

Not a little attention has been given in recent years to *Hemerocallis* and considerable success has followed. 'Radiant,' a rich orange-yellow; 'Lady Fermoy Hesketh,' with stems over 4 feet high and flowers of a rich apricot-yellow; and the variety 'E. A. Bowles,' with large well-expanded flowers of a shade bordering on orange, are but three chosen for inclusion here from a number of novelties all well worthy of a place in the border.

An unique Chinese Trumpet Flower has been produced in the form of *Incarvillea* 'Bees' Pink,' which has large Gloxinia-like soft rose-pink flowers. There have also been yellow forms recently introduced as *I. lutea*, but they are mostly still under the collector's number.



FIG 150 ANEMONE TETRASEPALA

[To face p. 488.



FIG. 160. *DICENTRA GLAUCA*

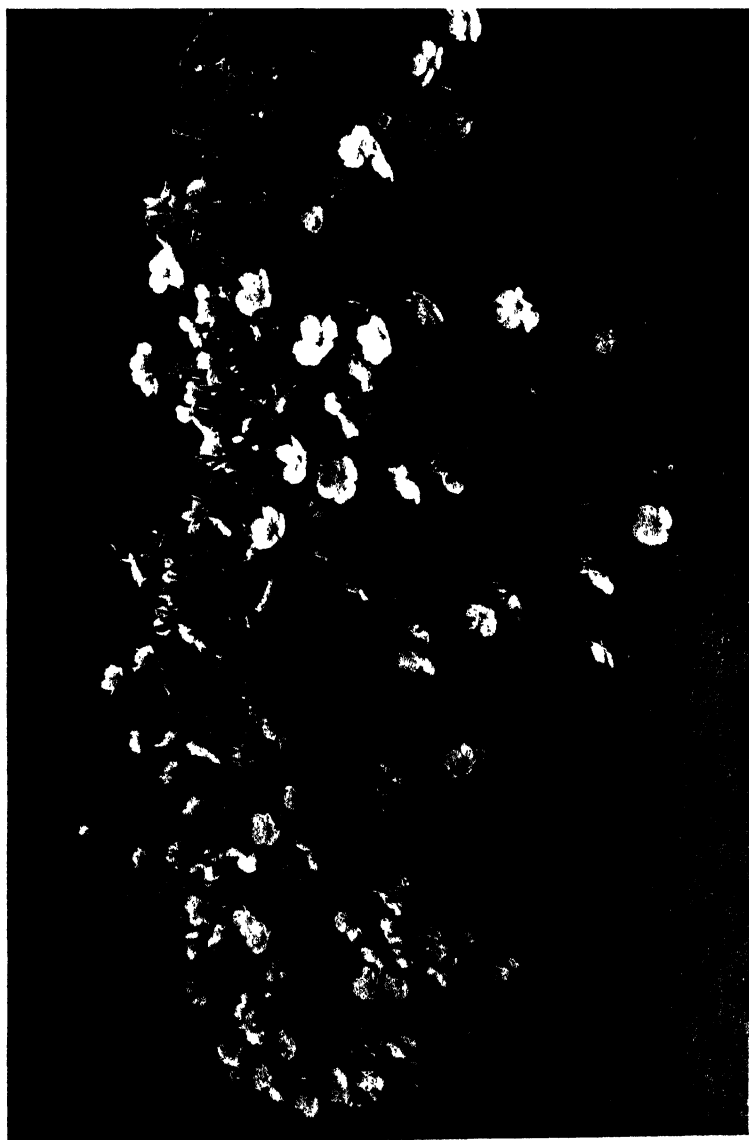


Fig. 101 OLIOHRA BERLONI.



FIG. 162. — ROSCOEA HUMEANA

For face p. 489.

I have yet to see a well-established plant in flower before deciding as to whether the plant will be worth growing or not.

A great deal of energy has been put into the hybridization of the bearded Irises; hence great strides have been made in the production of really good new varieties. The first place must be given to 'Golden Hind,' and the fact that this variety received the Dykes Memorial Medal and the Silver-Gilt Medal of the Iris Society in 1934 goes a long way to prove that my placing is correct. It is the finest Iris raised so far and has a personality of its own. It is a pure deep yellow, and in both colour and habit it is unique. 'Deputé Nomblot,' which was also the recipient of the Dykes Memorial Medal a year or so ago, is another beautiful new variety. It has standards of rose-purple shot bronze, falls rich garnet-red and an orange beard. It is a brilliant Iris and has an excellent habit. Another good variety is 'Anne Marie Cayeux,' with large flowers of rosy-heliotrope. The falls have a metallic-blue sheen and a bright yellow beard. The flower is of excellent substance. In 'Red Rover' we have a wonderful piece of colouring which I should describe as red-purple. The flower is well balanced and the whole plant has stately proportions. In the Pink Blends class, 'Violet Insole' produces a wonderful head of flower and will, without question, become an extremely valuable garden plant when stocks are available. In 1931 the Dykes Medal in France was awarded to 'Jean Cayeux.' It can be described as a self bronze with a shot copper effect. It is a most handsome plant, free-flowering, sturdy and rigid in habit.

Very dignified indeed are the Red-hot Pokers, and of the several new varieties 'Lighthouse,' with its massive scarlet heads, 'Majestic,' with its long pokers of salmon-orange, and 'Volante,' with its tapering inflorescence of bright coral-red on 6-foot stems, are the most outstanding.

Most lovely are the many new hybrids of *Lobelia cardinalis* which have recently come to the fore. It is a pity they are of doubtful hardiness, but the brilliant splashes they give to our borders warrant the little care which is necessary to nurse them through the winter. A very fine variety is *Lobelia* 'The Test,' a much improved form with large separate flowers, whilst 'Grandeur,' dark blood-crimson, and 'Jack McMaster,' a rich purple-blue, must not be overlooked.

There are such hosts of new Lupins turned out annually from nurseries and gardens all over the country, all of them beautiful but so many of them very much alike and, in some cases, no improvement on older varieties, that discrimination is necessary. A new variety which attracted considerable attention at one of the fortnightly shows this year was 'Grenadier.' It is possibly the most distinctive Lupin yet introduced. Its colour can be described as an intense terra-cotta red with a peculiar tinge of gold. More beautiful in substance than in name is the variety 'Hades,' a bronze-salmon which deepens with age to a bronze-red. Of a peculiar petunia shade is 'Trixie Parker,' which is a glorious sight in the mass. It has an exceptionally sturdy

spike with a long inflorescence and is the only Lupin which I know to stand well in water when cut. Although it has not quite the constitution of the foregoing varieties, 'Jean Wells' is a worthy plant. It is an exquisite shade of pink and has very large individual pips.

Lychnis 'Abbotswood Rose.'—Such a worthy plant is this that it received the high honour of being allowed to occupy an important bed at the Edinburgh Botanic Gardens by itself this year. Not the least of its merits lies in the fact that it is really perennial and does not gradually disappear after flowering. It is undoubtedly the very best of the *Agrostemma* section. The large flowers are of a rich deep rose, a striking contrast to the silver foliage.

As the name implies, *Nepeta Mussini* 'Six Hills Giant' is a very tall member of the genus. It is a valuable herbaceous plant as it flowers from June to October and is erect in habit with longer spikes of deeper coloured flowers than the type.

It was only this year that Paeony 'Kelway's Glorious' (fig. 165) received the A.M. of the Royal Horticultural Society. This variety is not new to Paeony enthusiasts, but it must be mentioned here as it is little known and is such a lovely plant. The flowers can only be described as being immense and pure white, whilst the scent is exquisite. 'Crimson Globe' is a scented officinalis form with globular deep crimson flowers. 'Phyllis Prichard,' a scarlet variety with a central tuft of bright golden anthers, will become very popular as it is strong growing and extremely free-flowering.

It is unfortunate that the energies of those interested in producing new Phloxes are somewhat latent. Perhaps this is because they think we should be content with the host of dazzling colourful varieties with which we are all conversant. There are, however, four that I would like to mention: 'Fairbairn's Delight,' with large well-formed head of heliotrope, paler centred pips, 'A. E. Amos,' with fiery scarlet brilliance rivalling the Arctic sun in intensity, 'P. D. Williams,' a delightful appleblossom-pink, with stripes of a darker shade, and lastly, 'Salmon Glow,' a cross between 'Jules Sandeau' and 'Elizabeth Campbell,' with lively pink shades, suffused salmon. These are, in my opinion, worth the notice of the connoisseur.

One of the most valuable of recently introduced autumn-flowering plants is *Physostegia virginica* 'Vivid.' For the front row of the herbaceous border it is pre-eminent. It produces crowded stocky spikes of brilliant rosy-crimson flowers which last for a long period. These spikes surmount bushy tufts of bright green foliage which considerably add to the charm of an exceedingly beautiful plant.

Pyrethrum 'Kelway's Glorious' is a splendid plant. It is a bright scarlet and flowers early. Another new variety is 'May Queen,' which, also flowering early, is of a bright pink.

A rather unexpected novelty is *Senecio clivorum* 'Othello,' which varies from the type in having rich brown stems and leaves, and these admirably set off the bold heads of orange rays and bronzy bumble-bee centres. The placing of this plant should not be restricted to the

waterside only—it is worthy of a place in the border as bog conditions are by no means necessary to its well-being.

A certain amount of confusion exists concerning the newer *Sidalceas*. One hesitates, therefore, to comment upon the new varieties at the moment. It is to be hoped that the forthcoming trial at Wisley will tend to straighten out this state of affairs. There are, however, two at least worthy of note: 'Crimson King' (fig. 166), which has a rather crowded spike of rose-crimson shot with a slight suspicion of bronze, and the double variety, 'Mrs. Barclay,' of dark rose.

Thalictrum dipterocarpum 'Hewitt's Double' in general effect can be likened to a violet-amethyst *Gypsophila*. On close examination the individual flowers are found to be surprisingly double, while in habit, growth and all other details it is similar to the type. It is an exceedingly worthy border plant, as has been proved this year by the admiration it has received from visitors to the new herbaceous border at Wisley. As a cut flower it has been known to last in water in a perfectly fresh condition for ten to twelve days.

A great improvement on the older varieties of *Tradescantia virginica* are the new 'Leonora,' with flowers of royal blue brightened by a central bunch of golden anthers, 'J. C. Weguelin,' with extremely large flowers of clear lavender-blue, and lastly, 'James Stratton,' a deep and attractive mauve slightly shaded rose, with flowers $2\frac{1}{2}$ inches across. These new Spiderworts with their larger flowers and bolder appearance are to be welcomed, for they add needed colour to the border during the late summer and autumn.

The list of new herbaceous plants which I have mentioned must not be taken as complete. It is obvious that time and space would not permit of this. I have endeavoured to include really worthwhile varieties with which any grower may be assured of success. I sincerely hope that some benefit will be derived from the presentation of this paper, as the making of the slides and the preparation of the notes have given me great pleasure.

In conclusion, my acknowledgments and thanks are due to the members of the Horticultural Trade who have so readily given me information; to Mr. BROWN of the R.H.S. Gardens, Wisley, for the loan of negatives; to Mr. GEORGE TAYLOR of Country Life, and Mr. ROY HAY for the loan of those slides which were not of my own making; and, last but not least, to Dr. WALTER WEIR for his patience and help.

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

LXXIV.—STRIPE DISEASE OF DAFFODILS.

By N. K. GOULD.

THE irregular discoloration of Daffodil foliage known as "Stripe" has long been familiar to growers, who have been at a loss to account for the occurrence of the symptoms or to discover any satisfactory remedial treatment. Horticultural literature of the past half-century contains few references to this malady, and these vary in the degree of importance which they attach to it. At a meeting of the Scientific Committee of the Royal Horticultural Society on May 10, 1894, "Mr. WOLLEY DOD showed leaves of *Narcissus incomparabilis* marked with longitudinal stripes of yellow. The condition was common this year, and independent of variations in soil. Mr. WILKS had met with the same experience." * It seems probable that the condition was less common in succeeding years, for BOURNE makes no mention of it in "The Book of the Daffodil" (1903), and little, if any, response was made to an appeal to growers to submit reports of the occurrence of "Yellow Stripe" together with details of their cultural methods and soil conditions published by the Royal Horticultural Society in 1904.† The problem was discussed at some length in the correspondence columns of *The Garden* in 1906–7. A. R. GOODWIN attributed the disease to a want of a change of soil,‡ a view supported by an Australian grower, who stated that marked improvement had followed the re-planting of certain varieties in "a new bed of maiden soil." § PETER BARR stated that his stock of the variety 'M. J. Berkeley' had almost always produced striped leaves for thirty years prior to 1906, both in the open border and naturalized in grass, and advanced the theory that Stripe was caused in this variety by some inherent weakness.|| The Rev. JOSEPH JACOB held the view that the cause was cold, and that weakening by overdivision might predispose plants to attack. He advocated the destruction of severely infected stocks, but thought that removal of bulbs to "some warm and favoured locality such as the south of Ireland" might effect a cure in some cases.¶ On June 9, 1908, H. R. DARLINGTON read a paper before the Royal Horticultural Society, describing the symptoms of Yellow Stripe, giving the names of varieties known to have suffered and advancing the opinion that cold and partial destruction of the roots (as by the larvæ of the Swift Moth) seemed probable causes of the trouble.** At a meeting of the Society's

* JOURNAL R.H.S., 17, p. xxii.

† *Ibid.*, 23, p. 595.‡ *The Garden*, April 7, 1906.§ *Ibid.*, August 31, 1907.|| *Ibid.*, June 9, 1906.¶ *Daffodils*, p. 54. 1910. Present-Day Gardening Series.

** JOURNAL R.H.S., 34, p. 161.



FIG. 103 - ALSTROEMERIA 'DOVER ORANGE'
(p 486)

[To face p 402.



FIG. 164 - DELPHINIUM RUYSII
(p. 488)

Scientific Committee on the same day, the use of fresh manure, late planting and too wet a soil were mentioned as contributory causes.*

During the next two decades little was written about Stripe, but more recently it has engaged the attention of American workers, and is dealt with at some length by McWHORTER and FREEMAN WEISS in papers published in 1932.† These workers hold the opinion that Stripe is due to the activity of one or more viruses, and class it with the "mosaic" diseases, and it is accepted as such by KENNETH M. SMITH.‡

Little work on the problem has been done in Great Britain, but W. E. H. HODSON has discussed the general aspects of the disease in the Daffodil Year Book (R.H.S. 1933) and in Scientific Horticulture (Vol. 3, 1935), in which appears also an article on the same topic by A. BEAUMONT, who regards "Yellow Stripe" as distinct from "Stripe" and holds that the former, which is common in 'King Alfred' and related varieties, is curable under good cultural conditions. While this may be the case, the present writer has so far failed to record any evidence of recovery in stocks of such varieties as 'Outrider,' 'Edgar Thurston' and 'Agnostic' which exhibit symptoms closely resembling those of 'King Alfred.'

SYMPTOMS.

(a) *Leaf Symptoms.* The most obvious symptom during the early stages of growth is the irregular discoloration of the foliage. The normal glaucous green leaf-colour is broken by stripes or mottling of bright grass-green, yellowish green or yellow. Close observation of a collection of over two hundred affected varieties growing at Wisley has revealed considerable variation in colour, size and distribution of the discoloured areas. The stock of a particular variety usually shows a more or less uniform type of marking, but stocks of some varieties, e.g. 'Golden Spur,' may exhibit two distinct forms of Stripe; thus some plants have the conspicuous yellow markings characteristic of what has been termed "Alfred Stripe," while the foliage of others is less brightly mottled with shades of green. This may mean that more than one virus is active in the one variety, but an alternative explanation may be that, as BEAUMONT suggests, the "Yellow Stripe" of 'King Alfred' and other Trumpet varieties is a disease of different origin and nature.

As the leaf ages, the discoloration becomes less conspicuous in plants which exhibit the dull coloured stripe, while in those showing the more contrasting yellow forms the symptoms may easily be observed as long as the foliage persists. In such varieties the yellowing is not infrequently supplemented, as the season advances, by

* JOURNAL R.H.S., 34, p. cxii.

† FRANK P. McWHORTER and FREEMAN WEISS. "Diseases of Narcissus," Bull. 304, Agr. Exp. Sta., Oregon, June 1932. F. P. McWHORTER. "Narcissus 'gray disease' is a transmissible mosaic," Florists' Exchange, lxxix, 14, p. 11. 1932.

‡ KENNETH M. SMITH. Recent Advances in the Study of Plant Viruses, p. 390. London, 1933.

bronze- or chocolate-coloured blotching, the leaf fading finally to a patchy, greyish-brown colour.

Striking symptoms in some varieties are bending or twisting of the leaves. Inaccurate diagnosis may result from confusion of the twisting due to Stripe with the natural twisting of the leaf in *Narcissus maximus* and its hybrids.

In a few varieties some degree of roughening occurs, but here again the damage consequent upon incorrect hot-water treatment may lead to confusion.

(b) *Flower Symptoms.* In stocks of striped Narcissi abnormalities of the flower may be expected. The flowers are often of smaller size, and poor texture, their stalks being shorter than those of healthy plants. In yellow-flowered varieties white or hyaline streaks or blotches may appear in the perianth, and white flecks in the corona have been observed in a few varieties.

TRANSMISSION.

The natural means by which the disease spreads from plant to plant is at present unknown. Aphides are known to be the carriers of some viruses, but Narcissi are usually free from aphides. The possibility of thrips being a carrier has been investigated by HODSON, whose experiments, however, proved entirely negative. MCWHORTER, in America, claims to have brought about transmission experimentally through the contact of injured roots of diseased and healthy plants growing side by side, and also by the introduction of the juice of diseased plants into the scratched leaves of healthy ones. In similar experiments conducted at Wisley and described below no artificial transmission was secured by these means.

EXPERIMENTS AT WISLEY.

In the spring of 1933 the Council decided that work on the problem of Stripe Disease should be undertaken at Wisley, with the twofold object of discovering, if possible, some method of controlling the disease and of gaining some information as to the way in which it is spread from plant to plant. A large collection of varieties which, at the time, was on trial in the gardens, was reserved for experimental purposes.

During the growing season of 1933 every plant in the collection was closely examined and a record was kept of the amount and character of the discoloration of the foliage of each variety. The wide symptom variation made any exact classification impossible, but by classing the symptoms as severe, moderate and slight, according to extent and severity of the discoloration, it was found possible to classify the varieties.

As the following table shows, only two divisions were completely free from the disease, viz. Division VIII (Poetaz) and Division XI (Tazetta). It must, however, not be assumed that species and varieties belonging to these divisions are immune from attack, for stocks of certain

Poetaz varieties exhibiting unmistakable symptoms of Stripe have since been received from various sources, and the two Tazetta varieties in the collection were represented by very small stocks collected in Kashmir and Turkey respectively.

Division.	Number of Varieties in Trial.	Number of Varieties Affected.				Number of Varieties Healthy.
		Severe.	Moderate.	Slight.	Total.	
I a	39	8	9	21	38	1
I b	26	7	5	8	20	6
I c	25	2	8	8	18	7
II a	45	6	17	15	38	7
II b	22	1	8	8	17	5
III a	8	2	2	3	7	1
III b	28	—	8	9	17	11
IV a	36	2	15	12	29	7
IV b	18	1	7	4	12	6
V a	10	5	4	1	10	—
V b	2	1	1	—	2	—
VI	3	—	1	—	1	2
VII	9	1	3	2	6	3
VIII	21	—	—	—	—	21
IX	29	3	2	10	15	14
X	9	4	1	2	7	2
XI	2	—	—	—	—	2

1. *The Effect of the Hot-water Treatment on Plants with Stripe Disease.*

In order to ascertain whether the standard hot-water treatment, consisting of three hours' immersion of the bulb in water heated to a temperature of 110° F., might reduce or increase the severity of the disease, ten bulbs each of eight severely affected varieties and eight moderately affected varieties were treated.

Severely affected.

Agnostic
Darwin
Primrose Phoenix
H.M. Queen Alexandra
Eskimo
Golden Sceptre
Alexas
Edgar Thurston

Moderately affected.

Breila
Cenig
Havelock
Norah Pearson
Frances Lyster
Herbert Beadle
Bath's Flame
Seagull

Date of treatment, September 10, 1933.

Date of planting, September 14, 1933.

The plants were examined in growth several times during 1934 and 1935, but were found to be indistinguishable from untreated controls of the same varieties. The experiment indicates that hot-water treatment has no effect in reducing or increasing the severity of the disease.

2. *The Effect of certain chemical substances used in conjunction with the Hot-water Treatment.*

In order to test the validity of claims made in respect of two proprietary fungicides, namely, Uspulun and Aretan, ten bulbs each of four severely affected varieties and eight moderately affected varieties were treated with solutions of these substances for three hours at 110° F.

EXPERIMENT 1.

<i>Severely affected.</i>	<i>Moderately affected.</i>
Darwin	Breila
Golden Sceptre	Cenig
Evangeline	Havelock
Edgar Thurston	Norah Pearson
	Frances Lyster
	Herbert Beadle
	Bath's Flame
	Seagull

Treated with Uspulun. $\frac{1}{8}$ per cent., $\frac{1}{4}$ per cent., and $\frac{1}{2}$ per cent. solutions used.

Date of treatment, September 14, 1933.

Date of planting, September 18, 1933.

EXPERIMENT 2.

<i>Severely affected.</i>	<i>Moderately affected.</i>
Inglescombe	Amoy
Sunpath	White Knight
Sybil	Breila
Evangeline	Grenade
	Aled
	Warlock
	Bath's Flame
	White Lady

Treated with Aretan. $\frac{1}{8}$ per cent., $\frac{1}{4}$ per cent., and $\frac{1}{2}$ per cent. solutions used.

Date of treatment, September 13, 1933.

Date of planting, September 18, 1933.

In no case was the severity of the disease influenced by treatment with hot solutions of Uspulun or Aretan. It is interesting to note, however, that both of these preparations have a stimulating effect on the growth of the foliage, which may appear above the soil earlier and usually persists longer than that of untreated bulbs. The somewhat deeper colour imparted to the leaves may mask the Stripe symptoms but does not eliminate their cause.

3. *The Effect of soaking affected bulbs in cold solutions of various chemical substances.*

The affected bulbs were soaked in cold solutions of twelve different chemicals. The strength of the solutions and the duration of the treatment were determined by reference to a report of tests made by RAMSBOTTOM * and were such as had been proved harmless to the bulbs. Ten bulbs each of two varieties were soaked in each solution and dried before planting.

<i>Variety.</i>	<i>Treatment.</i>
Cumulus	Potassium permanganate 1 per cent. 18 hours
Tunis	
Harebell	Mercuric chloride $\frac{1}{4}$ per cent. 18 hours
Nero	
Seashell	Potassium dichromate 1 per cent. 18 hours
White Colossus	
Capella	Phenol 2 per cent. 24 hours
Louise L. Linton	
Sesostris	Hydrochloric acid 1 per cent. 18 hours
Hon. Mrs. J. C. Francklin	
Egwin	Nitric acid 1 per cent. 18 hours
Melyn	
Autocrat	Ammonia 2 per cent. 48 hours
Cicely	
Sylvia	Cheshunt Compound $\frac{1}{2}$ per cent. 18 hours
Outrider	
Warlock	Hydrogen peroxide 1 vol. 18 hours
Gaiety	
Alceste	Formalin 4 per cent. 18 hours
Elspeth	
Souvenir	Chloride of Lime 1 per cent. 18 hours
Sybil	
Ladybird	Boric acid 1 per cent. 18 hours
Tuscan	

Date of treatment, October 8-10, 1933.

Date of planting, October 12, 1933.

There was no indication during the growing seasons of 1934 and 1935 that treatment of the bulbs with the solutions enumerated affords any control of the disease. Somewhat irregular development followed the use of mercuric chloride, phenol, formalin and chloride of lime.

* J. K. RAMSBOTTOM. "Experiments on the Control of Eelworm Disease of Narcissus," JOURNAL R.H.S., 43, p. 66 *et seq.*

4. *Hot-water Treatment as a possible means of transmitting the disease.*(a) *Standard Treatment. 3 hours at 110° F.*

In order to ascertain whether the disease might be transmitted from diseased to healthy stocks of bulbs in the ordinary course of treatment, stocks of eight severely affected varieties were treated together with stocks of eight unaffected varieties.

<i>Severely affected.</i>	<i>Healthy.</i>
Agnostic	Crimson Braid
Darwin	Medusa
Primrose Phoenix	Chinita
H.M. Queen Alexandra	White Emperor
Eskimo	Tartarin
Golden Sceptre	Tatcho Pal
Alexas	Beersheba
Edgar Thurston	Snowscape

Date of treatment, September 10, 1933.

Date of planting, September 14, 1933.

The stocks which were known to be unaffected at the commencement of the experiment were closely observed during the two seasons after planting, but up to the time when the foliage faded in 1935 no striped leaves or flowers were discovered. It appears, therefore, that there is no risk of contaminating clean bulbs by allowing them to come in contact with diseased ones during the ordinary hot-water treatment.

(b) *Incorrect Treatment. 4 hours at 112° F.*

Prolonged treatment at temperatures above 110° F. is very liable to result in damage to leaves and flowers produced in the following season. Stocks of eight moderately affected varieties together with stocks of eight unaffected varieties were subjected to incorrect treatment to discover whether the abrasion so caused facilitated the entry of the causal organism (?) and so brought about transmission of the disease.

<i>Moderately affected.</i>	<i>Healthy.</i>
Mystic	Gayton
Mitylene	Bittirinkini
Roundle	Lady Margaret Boscawen
Lord Kitchener	White Guard
Winsome	Lady of Cambridge
Condor	White Conqueror
Mount Erebus	Tashkend
Stolberg	Daylight

Date of treatment, October 9, 1933.

Date of planting, October 12, 1933.

The foliage of all varieties was damaged as a result of the treatment given. The flowers of some varieties were likewise affected. No symptoms of Stripe appeared in 1934 or 1935 in the plants known to have been healthy at the commencement of the experiment.

5. *Inoculation as a possible means of transmission.*

A series of inoculations was made on May 4, 1933, on plants growing in the open ground. The method employed was that of placing a leaf of an affected plant on the inner surface of a leaf of a healthy plant and pricking through both with a sterile needle. Five leaves of each healthy plant each received eight incisions.

<i>Affected.</i>	<i>Healthy.</i>
Princess Victoria	Emperor, 5 plants
Steadfast	Emperor, 5 plants
The Marquis	Emperor, 5 plants
The Marquis	Tresserve, 4 plants

A second series of inoculations was made on January 26, 1934, on plants grown in pots under glass, the leaves at that date being six inches tall. Drops of juice expressed from the leaves of affected plants were applied to shallow incisions made in the leaves of healthy plants.

<i>Affected.</i>	<i>Healthy.</i>
Barchard 79	Glorious, 5 plants
Golden Spur	Glorious, 4 plants
Barchard 79	Dame Blanche, 5 plants
Golden Spur	Dame Blanche, 5 plants
Queen Alexandra	Alceste, 6 plants

No Stripe symptoms appeared in the inoculated plants in 1934 or 1935, but the results are not convincing, for the number of plants treated was small and the method perhaps inappropriate. Many plant viruses have been proved transmissible by inoculation, but the methods of applying the inoculum are numerous and the facility with which transmission is accomplished varies considerably.

6. *Bulb-grafting as a possible means of transmission.*

In the summer of 1934 a number of bulb-grafts was made with the object of discovering whether the disease would pass from a diseased bulb to a healthy one *via* the freshly-cut surfaces of the bulb-scales. The method of grafting Tulip bulbs described by CAYLEY * was used. Thick vertical slices were cut from each of the two bulbs, the knife passing through the "basal plate" but leaving the central growing shoot intact. The two remaining portions were then firmly fixed

* D. M. CAYLEY. " ' Breaking ' in Tulips," *Annals of Applied Biology*, xv, No. 4, p. 533.

together with narrow strips of adhesive plaster. The bulbs were potted on the following day and later grown on in a cool greenhouse.

Affected.

Agnostic
Agnostic
Darwin
Darwin

Healthy.

Snowscape, 12 grafts
Tatcho Pal, 10 grafts
Snowscape, 12 grafts
Tatcho Pal, 10 grafts

Date grafted, September 13, 1934.

Date planted, September 14, 1934. Plunged outside and removed to greenhouse, October 30, 1934.

The growth of the plants was not seriously affected by the treatment described. They grew satisfactorily and flowered from February 22 onward. The plants of 'Agnostic' and 'Darwin' were as heavily striped as the controls of these varieties, while the plants of 'Snowscape' and 'Tatcho Pal' exhibited no Stripe symptoms. All are being grown on for observation during the coming season.

CONCLUSION.

The results of experiments made at Wisley over a period of two years may be briefly summarized as follows.

1. The Stripe disease of Daffodils is not transmitted from diseased to healthy bulbs during the hot-water treatment.
2. It has not been found possible to infect healthy plants artificially by means of inoculation or grafting.
3. No recovery from the disease has resulted from treatment of the bulb with hot water, or with certain chemicals in hot and cold solutions.

Until some remedial or preventive treatment is found, the only way to keep stocks reasonably clean is by continued roguing, that is, by the removal of all diseased plants as soon as the symptoms are recognized. Where plants are growing closely together, it is advisable to remove also those whose roots are in contact with those of affected plants. From stocks which show a high percentage of disease the clean plants should be lifted and carefully planted in a freshly-prepared site some distance from the original planting.

The writer's thanks are due to Mr. F. J. CHITTENDEN, F.L.S., V.M.H., Technical Adviser to the Royal Horticultural Society, and to Dr. M. A. H. TINCKER, M.A., F.L.S., Keeper of the Laboratory at Wisley, for very valuable advice and criticism.



FIG 165. -- PÆONY 'KELWAY'S GLORIOUS.'
(p. 490)



FIG. 166 -SIDALCEA 'CRIMSON KING'
(p. 491)

[To face p. 501.

RECENT DEVELOPMENTS IN WALNUT GROWING IN
ENGLAND.

By JOYCE B. HAMOND.
(East Malling Research Station.)

INTRODUCTION.

SOME ten years ago the late Mr. HOWARD SPENCE of Southport pointed out the desirability of improving the quantity and quality of English walnuts. The majority of walnut trees in England have been raised from seed, and often bear nuts of a very low standard. These nuts are usually small and dark-coloured, with the two halves of the shell often gaping open to disclose a disproportionately small kernel, frequently covered by a tough and bitter skin. Different indeed are the large, full-flavoured walnuts which come to us from France and California. These nuts are borne on vegetatively raised trees of approved, named varieties. The method adopted to improve the standard of walnut growing in England has therefore been to raise trees of good walnut varieties by vegetative means. In view of the work that has been carried out at East Malling Research Station on the vegetative propagation of fruit trees, Mr. SPENCE sought the co-operation of the station in this new work.

The first step towards the production of better walnuts was to select suitable varieties for growing in this country. These varieties had not only to bear walnuts of a high standard, but to leaf-out late, so avoiding the spring frosts which prove so disastrous to early-leaving varieties in England. As this factor excluded many excellent foreign varieties, a survey of English trees was made by Inspectors of the Ministry of Agriculture, in order to find a few which were worthy of extensive propagation. With a view to this end Mr. H. V. TAYLOR and the Royal Horticultural Society gave valuable help. A competition was arranged in 1929 under the auspices of the Society, to which owners of British walnut trees were invited to send samples of their nuts. Wide interest was aroused, and over 700 entries were received. These entries were subject to very severe tests, and, as a result, nearly all the nuts submitted were found to be below the required standard. Five samples, however, were selected as worthy of further propagation.

Since the selection of these varieties, work has included the testing and selecting of foreign varieties with a view to growing some of them in England, and the adaptation of known methods of walnut propagation and the initiation of new ones to suit English conditions. The harvesting and storage of walnuts during the winter, and the diseases of the trees and their control, have also been

under investigation. These investigations have been carried out with the aid of grants from the Ministry of Agriculture and the Royal Horticultural Society, and at the Society's Show for November 6 a demonstration was planned to illustrate the stage the work has now reached. The following outline is designed to give some idea of what was included in the exhibit.

PROPAGATION.

Experiments in walnut propagation have been carried out under the direction of Mr. A. W. WITT.

1. *Rootstocks*.—As walnuts do not root freely from cuttings or layers, seedling rootstocks have hitherto been used for most of the walnut propagation. One-year-old seedlings of *Juglans nigra*, the black walnut, or of *J. regia*, the English walnut, have been used with equal success for walnut grafting. The nuts are stratified in sand as soon as they are ripe, and then sown in the open ground in March. In the following November the resulting seedlings are lifted and potted preparatory to grafting.

Although seedling rootstocks are used for most of the walnut grafting, vegetatively raised rootstocks have been used on an experimental scale for the last three years. Several selections of *Juglans* species and hybrids are being tried, and now that the stools are getting older, satisfactory rooting is being obtained on the hybrids *J. regia* × *J. californica* and *J. nigra* × *J. californica*, known respectively as 'Paradox' and 'Royal' hybrids. It has been found that if the rooted layers are allowed to grow for one year in the nursery after being cut off from the parent stool, and then lifted and used for grafting, the results are as good as when seedling rootstocks are used.

2. *Grafting*.—Very little success has been obtained in grafting walnuts out of doors in this country. This is chiefly due to the fact that the walnut is very slow to form callus tissue and the scions tend to dry out before a union has been obtained. Grafting under glass can be carried out in March with dormant wood, or in summer using herbaceous scions. Minor improvements have been made since these methods were first adopted, but the essentials have already been described by WITT (5), (6). If hardwood grafting is carried out, it is most important that solid, well-ripened wood should be used. Hollow scions with a large proportion of pith to wood nearly always fail to take. Wood of the desired varieties is cut from the trees in January and, after the cut ends have been coated with grafting wax, it is stored in moist sphagnum moss until required. In February the stocks which were potted in November are moved into the propagation house, and after about a fortnight the actual grafting is carried out. The stock is cut down within 2 inches of the soil level in the pot so that the scion is inserted on the main root or just above it. A double whip-and-tongue graft is used. After the unions have been tied securely and coated with grafting wax, the plants are plunged in coconut fibre in closed frames with a bottom heat of 60° to 70° F. Here they are kept moist, and after about three weeks a union is formed

and the buds begin to burst. About 70 to 80 per cent. success is usually obtained by this method. The plants are gradually hardened off during the early summer, and then they are planted out in the nursery. After two or three years they may be moved to permanent positions. It has been found that union will take place, although more slowly, if the plants are left on the open bench after grafting. Essentially the same method is used when grafting herbaceous scions in the summer.

3. *Budding*.—Many experiments in outdoor budding and grafting have been carried out during the last few years, as a reliable method of outdoor propagation would make the trees much more economical to produce. Budding has given more promising results than grafting out of doors, so that attention has been concentrated on this during the last two seasons, and, although still at an experimental stage, it appears that a successful technique is now being evolved. In this method, dormant buds taken from the previous season's growth are used, a complete ring of bark including the bud being removed and transferred to the stock, from which a corresponding ring has been cut. The same double-bladed knife (4) is used on the stock and the scion, so ensuring an accurate fit. A narrow strip of bark is always left intact on the stock. After adjusting, the bud is tied with rubber strips or raffia, waxing being unnecessary. It is found that buds put into position from the latter part of May until the beginning of July grow out into good shoots before the end of the season. Using this method it should be possible to change a worthless walnut tree, grown from seed, into a good, named variety.

PRODUCTION OF BUSH WALNUT TREES.

Walnuts are usually grown as large standard trees so that heavy crops may be produced. Frequently, however, trees are desired in a restricted space such as a private garden, and hence the need for bush walnut trees has arisen. During the last few years, therefore, certain trees have been reserved at this station for experiments in the production of small trees for growing in a restricted space. These trees have been subject to little or no pruning, merely being "tipped" when five or six leaves have grown, in order to keep them symmetrical. As a result, strong shoots do not appear, and trees not more than two or three feet high, with several main shoots, begin to produce numerous short fruiting spurs bearing both nutlets and catkins. It has been noticed that some varieties, notably 'Meylanaise' and 'Woodland,' produce catkins much earlier than others. Thus these bush trees, as well as being restricted in size, have the added advantage of coming into bearing more quickly than standard trees. The latter usually produce only vigorous vegetative shoots during the early years.

DISTRIBUTION OF TREES.

In the last four years the demand for grafted walnut trees has increased steadily, since it became known that these trees are now being

produced in England. In the autumn of 1931 comparatively few trees were available, and these were distributed in six experimental sets which were planted in a belt across the South of England. Each set consisted of the same twelve varieties. In addition to these sets, the same varieties were also included in the complete variety collections planted at East Malling and at Mr. HOWARD SPENCE's farm in Sussex. It has thus been possible to make observations on the same twelve varieties growing at eight different centres.

In 1932 and 1933 a larger number of grafted trees was available, and a ready demand was found for them. In addition to supplying growers in this country, trees were sent to the Dominions and to other parts of the world. About 140 and 270 grafted trees were distributed in 1932 and 1933 respectively, and the demand far exceeded the supply.

As there appears to be an increasing demand for grafted walnut trees in England, it was suggested in 1934 that the trade should be invited to propagate grafted walnuts on a commercial scale (1). This suggestion was adopted, and four nursery firms have now been supplied with a nucleus of young grafted trees of varieties selected for growing in this country.

STORAGE OF WALNUTS FOR WINTER USE.

Experiments have been carried out at this station with a view to storing walnuts in a fresh condition during the winter. Only walnuts which are well sealed (*i.e.* in which the two halves of the shell do not gape open on gentle pressure from the fingers) will keep fresh and free from moulds during the winter. The following simple process has been found to give good results, and may be carried out without the use of any special apparatus (2).

It is important that walnuts should be harvested as soon as they fall from the tree, otherwise the green outer husk quickly becomes black and difficult to remove, leaving a discoloured shell beneath. After removal of the husk, the crevices of the shells must be freed from any trace of the husk which may be left, as it is here that moulds commence to grow. In America this is done by means of mechanical washers, but on a small scale rapid scrubbing with a soft nail-brush in water has been found quite effective. The nuts must not be allowed to remain in the water for more than a few seconds, otherwise the two halves of the shells will tend to crack open. After washing, the nuts are dried quickly in a single layer at room temperature. If they are still well sealed after this treatment, the appearance of the shells may be improved by dipping the nuts in a bleaching solution which may be cheaply prepared by this method, adapted from one suggested by WEIGAND (7) :

Three pounds of chloride of lime are placed in a five-gallon container and mixed into a creamy paste with a little water. About two gallons of water are added, and the mixture is stirred thoroughly; 1½ lb. of washing soda is dissolved in water in another container, and this

solution is poured into the chloride of lime suspension. Water is added to make a total volume of five gallons. After stirring, the mixture is left to settle for at least twenty-four hours. The clear supernatant liquid is then poured off and is ready to be used for bleaching.

After washing and drying at room temperature, the walnuts are transferred to this bleaching solution, and kept in contact with it for about three minutes. At the end of this time they are again dried in a single layer at room temperature.

The nuts are now ready for storing. Common salt has been found to be an excellent fungicide, but is unsuitable for a storage medium as it rapidly takes up moisture from the air, making the nuts very wet. If, however, the salt is mixed with slightly damp coconut fibre refuse in the proportion of one to one by weight, the fibre counteracts the hygroscopic properties of the salt, and the mixture makes an effective storage medium. Clean earthenware crocks are filled with alternate layers of nuts and the storage medium. The crocks are then kept in a cool place such as a cellar during the winter, walnuts being removed as required. Nuts stored in this way have been found to keep fresh and free from moulds from October until the experiments terminated in the following May.

DISEASES OF WALNUTS.

1. *Bacterial Blight*.—This trouble is known wherever walnuts are grown in large numbers. It is caused by a bacterium known as *Pseudomonas juglandis*. The disease, where present, is usually noticed soon after the trees leaf-out in spring. Small black spots appear on the leaves, and the bacteria spread from these to the young shoots and nutlets, causing the latter to drop when they are very small. The bacteria overwinter in lesions on the stems and in the bud-scales (8).

Several precautions can be taken to overcome this disease, which has not hitherto proved serious in England. As the bacteria are rapidly disseminated in the mists and rains of early spring, late-leaving varieties tend to be immune from bad attacks. As mentioned above, all the varieties selected for propagation in this country leaf-out late. On young trees, the stem lesions in which the bacteria pass the winter should be cut out during the dormant season. Finally, good control of the disease has been effected at this station by applying a protective spray of Bordeaux mixture at 8 : 8 : 100 as soon as the trees have leafed-out in spring. If the season is wet this may be followed by one or two applications of Bordeaux mixture at 8 : 25 : 100. If late-leaving varieties free from disease are procured, little trouble is likely to be experienced, and spraying will probably be unnecessary.

2. *Graft Disease*.—This disease, which is only of importance when walnuts are actually being grafted, had not been described until it appeared in this country a few years ago. It is caused by a fungus known as *Chalaropsis thielavioides* (3). When present this fungus grows over the cut surfaces of the walnut stocks and scions at the

point of union, preventing callus formation. About three weeks after grafting, the buds on walnut scions which have been attacked begin to drop off instead of breaking into new growth, and a discoloured area appears at the junction between the stock and scion. On untying diseased grafts, a layer of soot-like powder (in reality a mass of fungus spores) is seen covering the cut surfaces and preventing a union from taking place.

Inoculation experiments have shown that this fungus can only damage walnuts when a cut surface is available for its entrance, and when the plant is in a weak state. Both these conditions are found when walnuts are grafted, and, in addition, the warm, humid atmosphere of the propagation house is one in which the fungus grows well.

A simple and efficient control of this parasite is now being used. Formalin at 1 per cent. is found to be toxic to the fungus spores, so the propagation house is sprayed with this each spring before grafting is commenced. Also, before the walnut stock is cut preparatory to inserting the scion, it is painted with formalin. As a result of these precautions, very little trouble is now experienced from the fungus. When a reliable method of outdoor budding can be recommended, as seems likely to be the case in the near future, it is probable that this fungus will cease to be of economic importance in walnut propagation.

WALNUT CULTIVATION.

Soil.—A wide range of soils is suitable for walnut growing, and these trees have been found to thrive under many differing conditions. Good drainage is essential, and lime should probably be added to the soil in small quantities if it is not already present.

Planting.—A hole at least 2 feet square and 1 foot deep should be prepared; after loosening the soil at the bottom of the hole it is made firm again and normal care taken to spread the roots of the tree out on it. The long tap-root should be shortened to 12 inches, and the other long roots may be trimmed, but as many of the small lateral roots as possible should be retained. Loose soil is added gradually, care being taken to fill up all the space between roots. When the top layer of soil has been added, the ground is made very firm around the trunk. The latter precaution is very important, as it brings the roots in close contact with the soil.

Cultivation.—The ground for about 4 feet around the tree should be kept cultivated during the first few years, in order that air may get to the roots and that cracking of the soil in dry weather, followed by loss of moisture through deep cracks, may be avoided. Young trees should be protected from grazing animals by wire cages or wooden enclosures.

Pruning.—Walnuts are usually grown as large standard trees so that they may bear heavy crops and that animals can graze beneath them. If this type of tree is required, the main stem should be strengthened during the first 3 or 4 years after planting by allowing small shoots to grow on it, beginning 2 or 3 feet above the ground.

These shoots should be pinched back in summer so that they never exceed about 9 inches in length. As the head of the tree becomes well developed, these side-shoots, which by this time have become woody at the bases, may be entirely removed, leaving a clean trunk of approximately 6 feet. The wounds so made should be painted with white lead paint to prevent the entrance of any disease organism while the pad of healing tissue is being formed.

If it is desired to grow walnuts as bush trees for quick cropping and easy gathering, very little pruning is required, but the tips of any very vigorous shoots that threaten to take the lead should be pinched out, so that short stubby growth of moderate vigour is obtained. The short shoots must not be allowed to become unduly crowded, or the wood will not be sufficiently exposed to ripen and develop fruit buds.

Cutting out Dead Wood.—In young trees, any wood that dies back in winter should be cut out in the following spring when the trees have leafed-out. All wounds should be painted over with white lead paint to prevent the entrance of any disease organism.

Staking.—If a walnut tree over 6 feet in height is being planted in an open position, a stake will be necessary until the tree becomes established. It is important to avoid injury to the roots, so the stake should be driven into the ground before the tree is planted.

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ORCHARD-HEATING EXPERIMENT AT WISLEY, MAY 1935.

By A. N. RAWES.

THE experiment was conducted with 200 "Harrington" Orchard Heaters, supplied gratis for the purpose by Messrs. George Monro, Ltd., and with crude oil, 400 gallons, supplied gratis by Shell-Mex and B.P. Ltd.

The area covered by the heaters was approximately 4 acres in Deers Farm field, and the site is regarded as a "frost hole." Crops are bush and half-standard Apples interplanted with Black Currants and Strawberries.

The lamps were placed between alleyways, employing fifty to the acre. Each lamp holds 2 gallons of oil, which is sufficient for 8 hours' burning. The lamps were lighted at approximately 10 P.M. on May 17. No difficulty was experienced in lighting, two men igniting the 200 lamps in approximately three-quarters of an hour. Conditions were not altogether favourable for the experiment, as a gusty north-east wind, estimated at from 4 to 6 miles an hour, continued through most of the night. At 11 P.M. the temperature of the heated area was raised two degrees above the control area, and at midnight the thermometer in the heated area registered three degrees above the control area—this with appreciable wind at times. Taken at 7 A.M. on the 18th, the screen thermometer in the heated area registered a maximum of approximately six degrees above the control area.

The screen thermometer in the control area at 7 A.M. registered twelve degrees of frost. No serious damage was caused by the flames to trees and bushes, though some received an appreciable coating of carbon, and a few were slightly scorched—due to the wind blowing the flames.

There was insufficient oil available to continue the experiment on subsequent nights, and as frosts of five degrees and nine degrees (in the screen) were registered on the 18th and 19th respectively, the "top" fruits in the area were practically a total loss, and "soft" fruits were damaged very severely.

CONCLUSIONS.

The heaters raised the temperature by as much as six degrees, and this would be sufficient to provide protection to fruit crops against the frosts which may normally be expected in plantations more favourably situated than the small area in which the test was carried out.

OBSERVATIONS.

The refilling of the heaters is a slow and laborious work unless specially adapted filling tanks are available. Inquiries have been made as to the possibility of using solid fuel in the form of briquettes, as used in California, but it appears that as yet supplies are not available in this country.

The heaters discharge a considerable amount of light smoke, covering adjacent trees and buildings with a deposit of greasy soot, and in a small area this would be objectionable to neighbours.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

Cattleya × **virginialis** var. '**Olympia.**' A.M. September 25, 1935. A showy hybrid obtained by crossing *C. Lueddemanniana alba* with *C.* × '**Suzanne Hye.**' On this occasion the plant bore a spike of four large flowers, which are pure white, except for the lemon-coloured throat of the labellum. Exhibited by Messrs. Sanders, St. Albans.

Ceanothus azureus var. **Candolleanus.** A.M. September 10, 1935. From Mrs. Graham Smith, Sindlesham House, Wokingham. An excellent shrub which flowers from July until the first frosts of autumn. The leaves are from 1 to 2½ inches long, ovate, serrate, and downy on the underside. The panicles are 6 inches or more in length, and the striking blue flowers are arranged rather loosely.

Chrysanthemum '**Chastity.**' A.M. September 10, 1935. From Messrs. Johnson, Tibshelf. A pure white Decorative variety with slightly curved florets.

Chrysanthemum '**Clarion.**' A.M. September 10, 1935. From Mr. E. Riley, Alfreton. A dark ruby-crimson Decorative variety.

Chrysanthemum **erubescens.** A.M. September 25, 1935. From the Director, Royal Botanic Gardens, Kew. An attractive Chinese species, flowering profusely in the open ground during the early autumn. The slender branches bear small, finely cut leaves and dainty flower-heads with golden centres and narrow rosy-mauve rays 1 inch long.

Chrysanthemum '**Felicity.**' A.M. September 25, 1935. From Messrs. Johnson, Tibshelf. A large white Decorative variety with curled florets.

Chrysanthemum '**Hollicot Supreme.**' A.M. September 10, 1935. From Mr. T. Stevenson, Hillingdon. A deep yellow sport from '**Hollicot Yellow.**' The flowers are flattish and have broad florets.

Chrysanthemum '**Hollybank Bronze.**' A.M. August 27, 1935. From Messrs. Hussey, St. Leonards. A coppery-bronze Decorative variety with broad florets incurving at the tips.

Chrysanthemum '**Magnetic.**' A.M. September 10, 1935. From Mr. E. Riley, Alfreton. A bright terra-cotta Decorative variety with a golden reverse.

Chrysanthemum '**Peveril.**' A.M. September 10, 1935. From Messrs. Johnson, Tibshelf. A deep yellow, early-flowering Incurved variety with good globular flowers.

Chrysanthemum '**Pink Précoce.**' A.M. August 27, 1935. From Mr. T. Stevenson, Hillingdon. A bright light rose-pink sport from '**Rose Précoce.**'

Chrysanthemum '**Purity.**' A.M. September 25, 1935. From Mr. T. Stevenson, Hillingdon. A large pure white Decorative variety of very good form with broad florets.

Chrysanthemum 'Salmon Précoce.' A.M. August 27, 1935. From Mr. T. Stevenson, Hillingdon. A soft orange-salmon sport from 'Rose Précoce.'

Chrysanthemum 'Tibshelf Cream.' A.M. September 25, 1935. From Messrs. Johnson. A cream Decorative variety of good size and excellent form with broad florets.

Chrysanthemum 'Tibshelf Red.' A.M. September 25, 1935. From Messrs. Johnson. A large Decorative variety. The broad florets are deep chestnut-red with an old gold reverse and incurve at the centre of the flower.

Chrysanthemum 'Vallant.' A.M. September 25, 1935. From Messrs. Johnson. A medium-sized Decorative variety. The florets are chestnut-red and slightly rolled.

Chrysanthemum 'Velveteen.' A.M. September 10, 1935. From Messrs. Johnson, Tibshelf. A rosy-crimson Decorative variety of an unusual and very striking shade.

Clematis 'Blue Belle.' A.M. September 10, 1935. From Mr. E. Markham, Gravetye, East Grinstead. This plant was raised by Mr. Markham in 1925. It is a free-growing climber of rather slender habit and reaches a height of 12 feet. The dusky violet-blue flowers are borne abundantly from early August until October is well advanced.

Clematis 'Gravetye Beauty.' A.M. September 10, 1935. From Mr. E. Markham. A hybrid of the *C. coccinea* group, raised in France by F. Morel of Lyons. Clematis 'Gravetye Beauty' was introduced into this country by the late William Robinson in 1914. It makes 10 feet of growth and is said to be quite hardy. The bell-shaped flowers are of a dull crimson shade and are 1½ inch long.

Clematis 'Pourpre Mat.' A.M. September 10, 1935. From Mr. E. Markham. Commencing to flower at a time when many Clematis of its type are past their best, this plant is a specially useful one. It is a vigorous grower and attains a height of 18 feet. The flowers are 5 inches in diameter and of an attractive purple colour. The late William Robinson introduced it from France.

Heliotrope 'Sudeley Purple Emperor.' A.M. August 9, 1935, after trial at Wisley. From Mrs. Mary Dent Brocklehurst, Winchcombe. Plant of compact habit; 9 inches tall; branched and free-flowering. Flower stems erect. Foliage very dark greenish purple. Flower trusses flat, 4-5 inches across; flowers ½ inch diameter, deep rich purple, scented.

Hibiscus syriacus 'Hamabo.' A.M. September 25, 1935. From Mr. R. C. Notcutt, Woodbridge. A very decorative variety of this useful autumn-flowering shrub. The dark green leaves are 3 inches long, 3-lobed and crenate. The axillary flowers are 2½ inches in diameter, pale rose with crimson blotches at the base of the petals.

Laeliocattleya × 'Campagna.' A.M. September 25, 1935. A beautiful hybrid obtained by crossing *L.-c.* × 'Canberra' with *C.* × 'Heliodor.' The medium-sized flower has stiff sepals and petals of golden colour, while the roundly-formed labellum is mainly ruby-coloured. Exhibited by Lionel de Rothschild, Esq., Exbury.

GARDEN NOTES.

Berberis vulgaris.—It is well known nowadays that many fungi grow for part of the year upon one plant and for the rest of the year upon one totally different; and it often happens that one of the hosts suffers little from the presence of the parasite, while the damage done to the other may be very serious. It is by no means certain that in a climate of mild winters such as ours the absence of one of the hosts will result in the extermination of the fungus within the area and the consequent freedom of the other from attack; but it is certain that if it could be contrived the danger of the outbreak of the disease on that other would be greatly diminished, and when this alternate host is of major importance it is most desirable that such steps as can be taken should be used.

We have a good example of alternate hosts for a fungus in the common Barberry and the wheat. The fungus is *Puccinia graminis*, and it is an old observation that where a bush of Barberry stands in a hedge there the wheat near by is much more severely attacked by the rust, with consequent lowering of yield. This is not the only rust fungus attacking wheat, but it is one of the most serious. It does little harm to the Barberry upon which it grows in spring and upon which it produces spores capable of attacking not Barberry but wheat. On wheat it produces two forms of spore in summer and autumn, and on the wheat straw the autumn spores germinate and produce still another form which infects only Barberry in spring. The story has often been told since the history of the fungus was investigated, and the belief held by the farmer that Barberry was to be blamed for rust in wheat was shown to be based upon sound grounds. It is unnecessary to detail it fully here, but it is necessary to remind ourselves now and then of it, for there is naturally great temptation to plant the common Barberry in gardens and in shrubberies. There are few more beautiful bushes when the long bunches of fruit hang bright red in autumn and the foliage takes on its autumn tints.

In spite of its beauty and for the sake of the essential wheat the common Barberry ought therefore not to be planted anywhere near wheatfields. "Near" is a term difficult to define, for the minute spores from the Barberry can be carried long distances in the air and attack wheat of which the garden-owner may not be aware. It would therefore probably be best not to plant the common Barberry at all, and in some countries the planting of it is forbidden by law.

This ban does not apply to the great genus *Berberis* generally, for very few of its members are liable to attack by the fungus and they may be planted with impunity, and should be even more widely planted in gardens than they are. The hosts of Himalayan, Chinese, Tibetan, and S. American species are immune from attack,



FIG. 167 --ORCHARD HEATERS IN THE WISLEY TRIAL GROUNDS, MAY 1935.
(p 508)

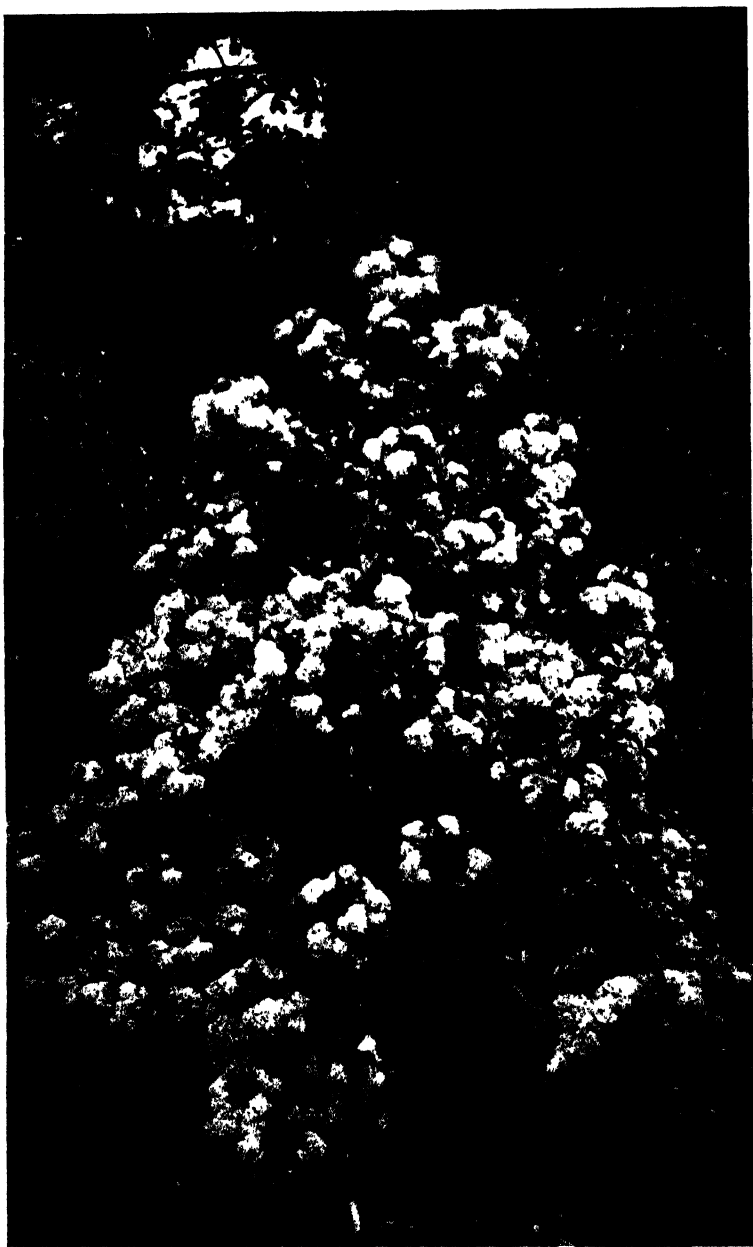


FIG. 168 OLFARIA ALBIDA

[To face p. 513.

and the only species upon which the ban lies is *Berberis communis* and its varieties. A few other species are occasionally affected, but so rarely as to make them negligible factors in the dissemination of the rust of wheat.—F. J. C.

Olearia albida.—The illustration is of a plant now 8 feet high and 5 feet through which five years ago was merely a piece taken off a bush and inserted as a cutting in the open border. It is growing between and in front of two taller home-grown seedlings of *Pittosporum tenuifolium* in Mrs. INGLIS' garden almost on the County Down shore of Belfast Lough, where the sea air and moist atmosphere are no doubt responsible for this most encouraging and satisfactory growth.

The aspect is approximately north-east, the soil rather heavy and sticky, but the roots of trees growing not far behind these shrubs must take away from them a fair amount of moisture.

In the same garden other species of *Olearia* grow well, but this particular one is easily one of the most handsome in flower, and comes in mid-August when there are few competitors of its own or any other family, although 6-foot specimens of *Buddleia Fallowiana* make strong challenge to its supremacy.

However suitable this *Olearia* may be in mild seaside localities, it is not to be whole-heartedly recommended for positions inland. On a light sandy soil in Surrey it does not thrive, but makes a spreading, even sprawling, bush of 4 feet or less in height and width, while even a rich woodland soil and overhead shelter of oak trees make little or no difference.

Olearia albida belongs to a group of four very similar white-flowered New Zealand species, and is most closely related to *O. avicenniaefolia*, from which it is distinguished, according to CHEESEMAN, by the leaves being oblong or ovate-oblong, usually bluntly pointed, and waved at the margin; the florets from three to six in each head. In the latter the leaves are elliptic-lanceolate, usually acute, and flat along the edge; the florets two or three in number. It is native to the South Island, whereas *O. albida* is found in the North Island only.

B. O. Mulligan, N.D.H., Wisley.

Anemone glaucifolia.—This rare *Anemone* is one of the most beautiful of the genus. It bears blue-violet flowers 3 to 4 inches across, on branching stems rising to some 3 feet, from a rosette of long indented leaves. A strong plant will bear ten or twelve flowers, some on the main stem and its branches, and others on subsidiary growths from the base.

This species was, I believe, introduced by G. FORREST from China many years ago, but the plants rapidly died out, as did most of those raised from FORREST's seed (1917-19), and one of the few places where it was successfully cultivated was at Borde Hill.

On his last expedition to China, FORREST sent back a further

supply of seeds. A share of these germinated well at Bodnant, but unfortunately the plant proves a difficult one to grow. It does not appear to be hardy in winter even in a cold frame, and it is intolerant of pot cultivation, remaining small and flowerless. Last autumn, however, the remaining pot plants, some twenty in number, were planted out in a frame with a hot pipe round it. Here they have done well, and this autumn about half the plants have flowered, producing among them close on one hundred blooms, spread over a long period, from July to the end of September.

It is hoped that these plants may set seed, although those that have flowered previously at Bodnant have not done so.

Lord Aberconway, Bodnant.

BOOK REVIEWS.

"Clematis." By E. J. Markham. 8vo. (Country Life, London, 1935.) 5s. net.

Mr. Markham has in this book ably dealt with a genus long neglected by those in a position to advise the many admirers of Clematis, the last authoritative work having been published in 1872.

No doubt Chapters 2 and 8 will be most eagerly read, as it is here that the cultivation, pests and diseases are referred to, and the sound advice as to planting requirements will be of assistance to many, though perhaps a little too much stress is given to the method of propagation as being the cause of so many failures. Are not these failures rather more due to the intensiveness of propagation by our growers than to the method?

His long experience has afforded the author a unique opportunity to try many species already well known, as well as those of comparatively recent introduction to this country; these are often overlooked, but their beauty and freedom of growth should encourage their cultivation, though careful selection is necessary as some are of little decorative value. Reference to this book will thus prevent disappointment and also save time, as many being small-flowered require to become fairly well established before giving their best.

The best of the large-flowered hybrids are well described and reliable selections for various purposes are given for those unable to make their own.

The note on p. 34 to the growth of the stock after the collapse of the desired variety probably refers to plants grafted on *Clematis Viticella*, a stock much used by Continental growers—but with plants grafted on *C. Vitalba* (the native "Traveller's Joy"), the stock most used in this country, this is impossible, as only the root is used, so that if a basal shoot should appear after collapse, which is quite likely, it will be of the desired variety.

Numerous excellent illustrations show the effect that can be obtained and the manner in which these plants—rightly credited with taking second place only to the Rose amongst climbing plants—can be used; Chapters 2, 5 and 6 extend their use far beyond that generally recognized.

Chapter 9, contributed by Mr. J. E. Spingarn, the eminent American authority on these plants, lends additional interest to this book, especially with the information given as to the species and varieties that will survive the very varied climatic and other conditions that prevail in America. This information will be welcomed by all and needed by many.

The fortunate possessors of an established plant of *C. Jackmanii* should not despair when looking at the illustration facing p. 54, as this shows a plant with flowers which are mostly eight-sepalled, rather more like *C. 'Nelly Moser'* than *C. Jackmanii*, which is usually four-sepalled, though occasionally five and rarely six.

The late Mr. William Robertson in his Foreword wrote: "This book should be in possession of all who love the Clematis"—a sufficient recommendation in itself.

"Wholesale Destruction of Rats without Poisons." By J. Lansdell. 8vo. 32 pp. (Lansdell, 85 Woolhope Road, Worcester, 1935) Paper covers, 1s.

A few methods of destroying rats which the author has found thoroughly dependable and capable of use without danger to other animals or birds, and with the infliction of a minimum of pain and suffering upon the rats, are described in detail. They appear to be such as can be carried out readily in ordinary circumstances, and depend largely for their efficacy upon allaying the suspicions of these wary pests.

NOTES AND ABSTRACTS.

Apple Fruit Miner, The; *Argyresthia conjugella* Zell. By J. H. Stapley (*Journ. S.-E. Agric. College, Wye*, 1934, no. 34, pp. 87-92; 3 figs.).—The larva of this Tineid moth has been known as a pest of Apples in England since 1897.

Descriptions are given of the egg, larval, pupal and adult stages, together with notes on the life history.

The normal host is the Mountain Ash or Rowan tree, *Sorbus Aucuparia*.

A number of field and laboratory observations is given as to the appearance of moths, oviposition, habits of the larvæ, and pupation.

The attack of the Apple Fruit Miner commences later in the season than that of the common fruit-mining pests and when spraying against them is over. The presence of this pest is not noticed until the fruit is gathered. The surface of an attacked fruit bears several sunken discoloured patches in the centres of which are white glistening lumps of crystallized juice, and, on splitting the fruit open, the flesh is seen to be mined by a maze of tunnels running in all directions.

The relation of Mountain Ash to the attack of the Fruit Miner on Apples has been investigated, and it is suggested that the insect turns its attention to Apples only when there are insufficient Mountain Ash berries available.

Preliminary attempts were made to control this pest under laboratory conditions, but further work is necessary before any practicable measures are advocated.—G. F. W.

Apple Spraying Demonstration in 1933, A Commercial. By W. G. Kent (*Journ. Min. Agric.*, 1934, vol. xli, pp. 733-742).—A full account is given of an Apple-spraying demonstration in Kent to control Scab.

Four applications both of Bordeaux mixture (3½ : 5 : 40) and of lime-sulphur (1½ gall. : 40 galls.) were applied between April 10 and May 22. The results showed that with Bordeaux mixture increases of 76·7 and 73·8 per cent. healthy Apples were obtained over the unsprayed trees on the upper and lower halves of the plot respectively. With lime-sulphur, increases of 63 and 60·8 per cent. healthy Apples over unsprayed trees were obtained on the upper and lower halves respectively.

The total costs of each operation were £6 8s. 10d. when Bordeaux mixture was used, and £7 8s. 9d. with lime-sulphur.—G. F. W.

***Aquilegia grata* Maly.** By W. B. Turrill (*Bot. Mag.*, t. 9405; July 1935).—A Balkan species about 18 inches high with purplish blue sepals with rather straight spurs and whitish petals. Hardy and seeding freely.—F. J. C.

***Buddleja auriculata* Benth.** By C. V. B. Marquand (*Bot. Mag.*, t. 9409; July 1935).—A South African species with small flowers, white with an orange throat, in dense stalked clusters in the leaf axils; sweetly scented, flowering in October and November, and capable of growing in sheltered places in the open.—F. J. C.

***Bulbophyllum elassonotum*.** By V. F. S. Summerhayes (*Bot. Mag.*, t. 9409; July 1935).—A new species with a dense inflorescence about 6 inches long of small deep orange flowers. Collected by Mr. G. L. Hinde in Assam.—F. J. C.

Cabbage Root Fly, Further Experiments (1934) on the Control of the. By E. E. Edwards (*Journ. Min. Agric.*, 1935, vol. xlii, pp. 34-38).—The results of the 1931-1933 field experiments have already been noted (*R.H.S. JOURNAL*, 50, p. 415). In the 1934 field investigations it was decided to concentrate upon two non-poisonous treatments, viz. magnesium sulphate or "cattle salts" (1½ oz. to 1 gallon of water) and tar-distillate (1 fluid oz. to 1½ gallon of water).

The general lay-out of the trials is described—the plants used being Cauliflower 'Improved Eclipse.'

The most satisfactory treatment proved to be corrosive sublimate at the rate of 1 oz. in 10 gallons of water applied in three applications of $\frac{1}{4}$ pint per plant. The degree of control was of a lower order than in previous years, when a concentration of 1 oz. in 8 gallons of water was used. The average percentage of plants attacked at three centres was: Control, 71 per cent.; corrosive sublimate, 19.3 per cent.; tar-distillate, 39.6 per cent.; and magnesium sulphate, 41.5 per cent.—G. F. W.

Colorado Beetle at Tilbury.—II. By J. C. F. Fryer (*Journ. Min. Agric.*, 1935, vol. xli, no. 11, pp. 1058–1062; 1 map).—A description of the discovery of the Colorado beetle at Tilbury in August 1933 having already appeared (*R.H.S. JOURNAL*, 50, p. 415), this paper gives some account of the subsequent developments.

The methods of soil-sampling were further developed and, as a result, further infested areas were found both in Essex and on the Kentish side of the river—the position of the areas being shown on a map.

A description is given of the method of inspecting some 9000 acres of Potatoes 4011 of which were sprayed—1759 acres in Essex and 2252 acres in Kent.

The success of the measures employed—soil injection with carbon bisulphide and wet spraying of the foliage with arsenicals or Derris—has resulted in the infested area being cleared of the pest.

An attack of Colorado beetle was detected in July 1934 near Stude, Germany, approximately in the same district in which the pest occurred in 1914.—G. F. W.

Dicranostigma Franchetiana Fedde. By K. H. A. Shaw and J. R. Sealy (*Bot. Mag.*, t. 9404; July 1935).—Differs from *D. lactucoides* by its glabrous ovaries and fruits. An annual poppy-like plant with yellow flowers closely allied to *Glaucium*, native of Szechwan and N.W. Yunnan.—F. J. C.

Enkianthus chinensis Franchet. By J. R. Sealy (*Bot. Mag.*, t. 9413; July 1935).—Distinguished from *E. deflexus* by the glabrous under surfaces of the leaves, and from *E. campanulatus* by the hairy anthers, style and ovary. A shrub up to 10 feet high with yellow rose-tinged flowers in pendent racemes of 12 to 24. Native of W. China and Upper Burma.—F. J. C.

Eucryphia Moorei F. Muell. By N. Y. Sandwith (*Bot. Mag.*, t. 9411; July 1935).—Too tender for most of Great Britain, this native of south-east Australia has opposite compound leaves with lanceolate leaflets and white axillary flowers. A showy small evergreen tree where it succeeds.—F. J. C.

Flea Beetles in Seed-Beds, The Control of. By F. R. Petherbridge and I. Thomas (*Journ. Min. Agric.*, 1935, vol. xli, no. 11, pp. 1070–1078; 1 plate).—Owing to the methods generally recommended for controlling Flea Beetles being inconsistent, the authors conducted a series of experiments on their control in the market-gardening areas of Bedfordshire during 1934.

Emphasis is laid on the importance of recognizing Flea Beetle attack in the early stages, for the underground attack is severe and is generally ascribed to frost.

Seven species of Flea Beetles were found attacking Cabbage plants during the course of the investigations, and short notes are given of the life history and nature of attack.

A number of trap crops were sown alongside Clinton's Drumhead Cabbages, and the beetles showed a distinct preference for white Turnips.

Ten materials were used, and medium and light Derris dusts (0.2 per cent. Rotenone) gave the best results. Hydrated lime proved useful if applied in large quantities at frequent intervals. Nicotine dust gave fair results, but is much more expensive. Grade 16 naphthalene was useful to prevent early underground attacks if applied before the plants came through the ground.

The following recommendations are given for Brassica seed-beds: (i) to prepare as fine a tilth as possible; (ii) to apply naphthalene or a Derris dust about 4–5 days after the seed is sown; (iii) to dust with a light Derris dust as the plants are coming through the ground; (iv) to continue with the Derris dust at intervals of 3–5 days, depending on the weather and extent of attack; and (v) to keep a careful watch on the seed-beds—the examination should take place twice a day during fine weather. The quantity of light Derris dust per cent. is about 30 lb. per application if the plants are in drills about 2 feet 6 inches apart.

G. F. W.

Flea Beetles, The Control of : with a Naphthalene-Silica Dust. By H. W. Miles (*Journ. Min. Agric.*, 1935, vol. xli, no. 11, pp. 1079-1083; 2 plates).—Serious injury by three species of Flea Beetle was caused to seedlings of Brassicae (Swedes, Kale, Cabbage and Sprouts) in north and west Lancashire and mid-Cheshire during 1933 and 1934.

The results of dusting seed-beds of Brassicae with a repellent dust consisting of 50 per cent. pure naphthalene and 50 per cent. colloidal silica are set out in tabular form.

The application of this dust at the rate of 55 lb. an acre at the time the seedlings of Swedes and other Brassicas are breaking through the soil will give adequate protection against Flea Beetles. The dust may be applied by means of a knapsack duster, with which type of machine two men can dust an acre in about 1½ hour.—G. F. W.

Glasshouse Symphylid and its Control, The. By H. W. Miles (*Journ. Min. Agric.*, 1935, vol. xlii, pp. 450-457; 7 figs.).—The so-called "White Insect of Guernsey," *Scutigerella immaculata* Newport, was recorded in 1912 by Theobald as being associated with injury to young Tomato plants.

Descriptions are given of the egg, larval and adult stages, while the life history is described in detail.

The host plants in this country are confined to glasshouse crops, namely Tomatos, Lettuce and Sweet Peas. The nature of injury on each plant is mentioned, and "patchiness" in the crop is stated to be typical of attack by symphylids.

This symphylid appears to be world-wide in distribution. It generally infests the top 1 inch of soil, but leaves the surface soil to escape from unsuitable conditions, i.e. when the temperature rises above 60° F.

The control measures recommended against this pest include : (i) the thorough preparation of the soil between crops to break down crevices in the soil and so hinder the movement of the insects ; (ii) the setting out of Tomato plants with well-developed root systems ; (iii) the treatment of the soil with carbon bisulphide emulsion—a strength of 1 : 60 for application to the subsoil when trenching, and 1 : 100 applied to the surface soil after the trench has been filled in ; the rate of application being 1 gallon of the diluted solution to the square yard of subsoil, and 2 gallons for surface treatment.—G. F. W.

Leiden Botanic Garden. Plants in Clusius' time. By H. Veendorp. (*Mededeelingen uit den Leidschen Hortus. II. De beteekenis van Charles de l'Ecluse voor den Hortus te Leiden*) (*Nederlands Kruidkundig Arch.* 45, 1935; figs.).—An interesting account of the plants grown in the original Botanic Garden at Leiden by Clusius, the first Professor of Botany to plant there. The names of the plants are given as in the Index Stirpium of 1594—the year of the planting—in Bauhin's Pinax (1623), in Richter's List of 1840, in Linnæus' Species Plantarum, and as at the present day. Over a thousand species and varieties were already in the garden in September 1594, and of these one tree, a Laburnum, now having a circumference of 16 feet 4 inches at the base and 57 feet high, still remains.

The inventory from which the present list was compiled appears in the contemporary records of the University and is the first complete planting list of any botanic garden.—F. J. C.

Mushrooms, Investigations on the Insect and Allied Pests of Cultivated. Parts II and III. By M. D. Austin and S. G. Jary (*Journ. S.-S. Agric. College, Wye*, 1934, no. 34, pp. 70-86; 10 figs.).—Part II of this paper deals with a survey of the incidence of Mushroom pests present on commercial beds.

The several pests are considered under the Natural Order to which each group belongs, viz. : (i) *Diptera*, Families *Mycetophilidae*, *Phoridae* and *Cecidomyiidae* ; (ii) *Collembola*, Family *Poduridae* ; (iii) *Acarina* ; and (iv) *Nematoda*. Short notes are given as to the general habits of the more important species.

Part III is entitled "The Natural Fauna of Stable Manure used in the preparation of Mushroom beds." Several lists of insects and mites present in the manure used for Mushroom beds are given which, on examination, show a notable absence of any of the known pests of Mushrooms.

The types of injury produced by some of the more important pests of Mushrooms are illustrated.—G. F. W.

Pigmy Mangold Beetle, The : A serious Pest of Sugar-Beet and Mangold Crops. By F. E. Edwards (*Journ. Min. Agric.*, 1935, vol. xlii, pp. 148-154).—*Atomaria*

linearis Steph. is the most destructive pest in the early growth of Mangolds and Sugar-Beet.

General field observations and laboratory studies on the pest have been carried out over a period of six years, commencing in 1927.

Short notes are given of the life history.

The host plants include Sugar-Beet, Mangolds, Garden Beet and the weed *Chenopodium album* (Fat Hen or White Goosefoot).

The beetles feed on the shoot of the seed as it germinates, on the finer roots, cut out small excavations from the main root, and eat the leaves.

Detailed descriptions are given of field control trials over a period of years.

The only recommendation for exterminating the beetle once it has become established is to alter the rotation and rest the ground from Beetroot and Mangolds for at least two years. Other measures include: (i) destruction of weed hosts; (ii) encouragement of rapid growth by applying a nitrogen fertilizer; (iii) steeping seed prior to sowing for 20 minutes in a solution of 5 lb. magnesium sulphate and 1 lb. phenol in 10 gallons of water; (iv) sowing of an extra quantity of seed; (v) the consolidation of the seed-bed; and (vi) thinning out at the latest possible date having regard to soil and climatic conditions.

G. F. W.

Plum Fruit Sawfly and its Control, The. By H. W. Miles (*Journ. Min. Agric.*, 1935, vol. xlii, pp. 129-133; 5 figs.).—*Hoplocampa flava* L. has been recognized since 1909 as a serious pest of Plums, mainly in the south and west of England. By 1912 its presence was noted in the Damson-growing areas of Westmorland, and in 1925 infestations were severe in the eastern counties.

Descriptions, together with photographs, are given of the adult, egg and larval stages.

The life history is described in detail—the time at which various stages can be found being tabulated.

Some variation exists as to the susceptibility of varieties to attack—'Czar' and 'Victoria' suffering more than early-flowering varieties, e.g. 'Monarch,' and later-flowering varieties, e.g. 'Pond's Seedling.'

A marked reduction in infestation followed the use of a nicotine wash—8 oz. nicotine and a spreader in 100 gallons of water. The most important factor in successful control of this insect is the time of the application. The time recommended is about 10 days after petal fall, and two applications within a week appear advisable.—G. F. W.

Primula amethystina brevifolia Franch. By Sir W. W. Smith (*Bot. Mag.*, t. 9410; July 1935).—Native of West China. This form is a subspecies of *P. amethystina* and is the only one of its section (save *P. Kingii*) to flower in cultivation so far. The figure shows a basal rosette of broad leaves with an erect scape about 6 inches long terminated by a cluster of eight flowers, campanulate from a narrow tube and about $\frac{1}{4}$ inch long, purplish blue.—F. J. C.

Psylla peregrina Först., the Hawthorn Race of the Apple Sucker, *P. mali* Schmidb. By K. B. Lal (*Ann. App. Biol.*, 1934, vol. xxi, pp. 641-648).—This investigation has proved that the so-called *Psylla peregrina* and *P. mali* of Hawthorn are identical, and are only the seasonal forms of one and the same species.

The life history of the two Psyllids on Hawthorn and Apple is similar. *Pyrus Malus* is the normal host plant of the Apple form, and *Crataegus Oxyacantha* that of the Hawthorn form. An indication of the degree of preference given by each form is shown in Table I, in which the abundance of eggs on 14 species of *Malus* and 15 species of *Crataegus* are given.

The morphology of adults and nymphs is described, together with experiments on oviposition, mating, and the transference of nymphs to different hosts.

It is proposed to assign the name *P. mali* Schmidb. race *peregrina* to the form found on Hawthorn.—G. F. W.

Rhododendron campylogynum Franch. By J. Hutchinson (*Bot. Mag.*, t. 9407A; July 1935).—Syn. *R. caeruleo-glaucum* and *R. glauco-aureum*. A small Chinese species about 4 to 5 feet high with small obovate or oblanceolate leaves and terminal clusters of drooping bright mauve purple flowers about an inch long on red hairy stalks about 3 inches long.

Rhododendron vaccinioides Hook. f. By J. Hutchinson (*Bot. Mag.*, t. 9407B; July 1935).—Syn. *R. sino-vaccinioides*. A small, straggling species from Sikkim and Northern Burma, where it grows on trees or rocks, needing shade and

greenhouse treatment in the British Isles. Flowers small, broadly and shortly tubular, white or pink. Leaves small, spatulate-oblancoale.—*F. J. C.*

Rhodohypoxis Baurii Nel. By E. Milne-Redhead (*Bot. Mag.*, t. 9412; July 1935).—Native of the eastern mountains of S. Africa and needing an open sandy soil moist in summer but not wet in winter, and perhaps best accommodated in the alpine house, this pretty little plant is typically red, but the white form which has been called *R. platypetala* is equally common wild and is reduced to a form of *R. Baurii* as forma *platypetala*.—*F. J. C.*

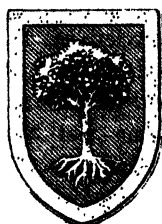
Sempervivum, A new Spanish. [*Ein neues Sempervivum aus Spanien.*] By J. A. Huber (*Fedde, Rep. Sp. Nov.*, xxxiii, pp. 363–366, t. cxl; March 1934).—In Praeger's *Sempervivum* there is no reference to the occurrence of the genus in Spain, although Willkomm and Lange in 1880 recorded four species and Pau in 1906 described *Sempervivum Vicentii* from the Pico de Urbion. This paper describes another Spanish House-leek, *S. cantabricum* Huber, which has been in cultivation since 1910, the original stock being collected by Haag on the Picos de Europa in Cantabria, North Spain. The half-open rosettes are 4–5 cm. across, the leaves oblanceolate, being broadest in the upper third, ciliated at the margin and minutely glandular-pubescent above and below, up to 3.5 cm. long, 1 cm. broad, dark green with dark red tips; the flowering stem rises to 16 cm., carrying a 5–10-flowered, 3-branched inflorescence 5–6 cm. across, with blunt globular buds and 9–12-partite, dark carmine flowers 15–18 mm. across; the petals are 9–10 mm. long and glandular-pubescent on back and margin, the stamens 5 mm. long with purple glabrous filaments and purple anthers, the scales minute, sub-orbicular, 0.6 mm. long and broad, the carpels pubescent on the back. Its nearest ally seems to be *S. dolomiticum*, from which its larger rosettes, dark carmine flowers and other characters distinguish it.—*W. T. S.*

Sorbus Esserteaulana Koehne. By J. R. Sealy (*Bot. Mag.*, t. 9403, July 1935).—It is considered that *S. Conradinae* is synonymous with this species. A hardy tree with compound leaves of 11 to 13 leaflets, hairy beneath. Inflorescence a broad corymbose panicle, fruits scarlet. Native of Western Szechwan.
F. J. C.

Vagaría parviflora Herbert. By F. Ballard (*Bot. Mag.*, t. 9406; July 1935).—A Mediterranean species sometimes referred to *Pancratium*, with flowers about 2 inches across having narrow greenish white segments. Inflorescence an umbel. Leaves 4 to 6, strap-shaped, shining green up to 2 feet long. A cool house plant.—*F. J. C.*

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THE GARDENS AT MOUNT STEWART.

By The MARCHIONESS OF LONDONDERRY.

MOUNT STEWART of the Ards in Co. Down, Northern Ireland, is situated on a narrow neck of land facing almost due south on the shores of Strangford Loch. It is to all intents and purposes as favourably situated climatically as if it were on an island. Where the house stands the peninsula is only about six miles in breadth from sea to sea. Belfast Loch on the northern shore sweeps right inland, its course bending in a southerly direction as it nears the city, leaving only a narrow strip of land between the two lochs at the head of the peninsula some five or six miles west of Mount Stewart. This explains the mildness of the climate and the phenomenal growth of the vegetation. Except perhaps from Christmas, or a little later, to the end of January or beginning of February, there is no cessation of growth and hardly any period when the plants are at rest.

The rainfall is about the average, but the air is very soft and humid, as it is bound to be, surrounded on all sides by the sea.

No gardening of the modern type was attempted at Mount Stewart before the war, when the late Lord and Lady LONDONDERRY lived there. After all, except for the few enthusiasts who understood and subscribed to the very early expeditions, this type of gardening has only been made possible during recent decades owing to the rich store of material brought home by intrepid plant hunters who have made numerous expeditions in search of *Flora* and *Sylva* to many almost inaccessible corners of the earth.

Fourteen years only have passed over the gardens that have grown up since the war. The illustrations bear eloquent testimony to

what in another climate would be inconceivable to accomplish and impossible to believe.

Year by year, new and more delicate shrubs and plants are thrust into the open to take their chance; very few indeed have succumbed, and these more often from some other reason than failure to withstand the climate.

Equal interest is taken in trees, shrubs and plants at Mount Stewart, and various forms and types of garden are represented.

LORD LONDONDERRY succeeded his father during the war, and in the critical years in Ireland after the Armistice he was asked to give up official work in England and join the new Northern Ireland Government. He accordingly became the Minister for Education. This entailed our living in Ulster for a great part of the year. Another consequence of the war, and one which created the opportunity of making the gardens round the house, was the demobilization of the army. Every employer in Ulster who could do so undertook to provide work for ex-service men, in addition to the ordinary employees. This, from my point of view, was an opportunity not to be missed.

Like so many Irish houses similar to Mount Stewart, there were no gardens near the house, which was surrounded by trees, planted and allowed to grow up into magnificent specimens, in close proximity to the building. These excluded all air and light, let alone any view from the windows. I can well remember my rather sad impressions of a visit I paid to Mount Stewart in former days, of a dark and damp abode, with dank and dripping vegetation all round! If ever a house was being bullied by trees—and trees can be dreadful bullies—Mount Stewart was a pathetic example. It is difficult to determine the *via media* between destruction and construction; to some people the removal of a tree can and will always spell destruction.

However regrettable it may be and appalling to relate, the very first thing that my husband and I set our hands to was the immediate removal of three beautiful Ilex trees on the south side of the house, which must have dated from the time the place was built, *i.e.*, any time between 1750 to 1780. These trees stood on what once must have been the lawn, only that by this time there was hardly any lawn left and the foliage of one immense tree almost touched the windows of the house.

In planning the new formal gardens on the southern and western aspects, numerous other trees and shrubs and huge masses of Rhododendrons had to be felled and cleared, until at last the space intended for the gardens began to take shape.

They are planned on the Italian style, but on much less grandiose lines, suited to modern ideas and possibilities, yet they convey an impression of dignity, space and restfulness, three things that all designers of gardens must strive for.

No architect has been employed on the design and make of the gardens: whether for better or worse, this must be left for visitors to decide. We are singularly happy in our gardener, Mr. T. BOLAS, who

is able and willing to carry out designs from the roughest plans, and together he and I have worked out the designs, whether of buildings, walls or flower-beds, on the actual sites.

The design of the beds for the south garden was adapted from one of the formal gardens at Dunrobin Castle, but the plan at Mount Stewart is smaller and duplicated. The beds centre on two fountains. This garden lies at the foot of a terrace surrounding the house, broken in the centre by a flight of rather bold three-sided steps which lead down to another terrace some ten feet below. This is raised above the main garden by a low wall some two feet high. Immediately facing this garden, across a lawn, circular steps lead down to another small sunken garden backed by a summer house with Spanish tiles.

In the centre of this little garden there is an oval pool, and round about *Cinerarias* of a beautiful blue colour are seeding themselves everywhere, whilst in the formal raised beds large greenhouse *Fuchsias* luxuriate. The garden is edged by stone beds and arches of *Cupressus macrocarpa*. In one of the stone beds plants of *Boronia megastigma* are flourishing and scent the air all round. The design for this garden was taken from one of the old original Adam ceilings in the house.

The main south garden is surrounded on all sides by walls; on each side they are about 8 feet high, rising to 10 feet at intervals on which animals are resting on stone plinths. On the southern front there is a retaining wall which runs the length of the garden, one end being level with the ground, and at the other end there is a drop of something like 12 feet. This wall on the garden side is not more than 4 feet high and is divided into two tiers—the lower tier has stone slabs forming seats the entire length of the wall some 200 yards in length. The seats are flanked at intervals by pillars which form buttresses to the seats; they taper up into the form of monkeys holding pots on their heads, in which Aloes have been planted and thrive!

On the west side of the house there is a sunk garden, planned to frame it. The garden is surrounded on three sides by a 10 feet high hedge of *Cupressus macrocarpa*, which incidentally took only three years or less to grow to its full height. The hedge flanks a pergola with solid square stone piers, and heavy home-grown oak beams across the piers, on which grow vines and roses, *Solanum jasminoides*, and a host of other interesting things, including *Actinidia chinensis*, from the fruit of which we make delicious jam. *Dendromecon rigidum* is another treasure 12 feet high and its long golden-yellow blooms are seldom out of flower; *Clematis Armandii* and *Calceolaria violacea* are also here. *Mitraria coccinea* blooms away on the shady side of the wall facing north. Space forbids enumerating all the plants. A terrace runs right round the garden-square beneath the pergola; it is bordered by flame Azaleas, which are really a blaze of colour in spring and wine-coloured foliage in autumn. Bold groups of Tiger Lilies are planted amongst them for a late effect. In the four large geometrical beds on the ground level, which are shaped to leave a large space of lawn

in the centre, are planted groups of Hydrangeas and shrubs of *Ceanothus* grown as standards: *Ceanothus* 'Gloire de Versailles,' *C. Burkwoodii*, which is particularly good, and *C.* 'Autumnal Blue' give good effects in late summer and autumn. There are large clumps of *Agapanthus*, *Salvia uliginosa*, *Aconitum*, *Lilium Henryi* and *L. pardalinum*.

Beyond this garden, directly facing the west front, there is a stone-paved garden in the shape of a shamrock surrounded by another and even taller hedge of *Cupressus macrocarpa*. Running round the top of the hedge is a complete caricature of an ancient hunting scene supposed to represent the family of Stewart arriving for the chase: the arrival by boat in an ancient coracle in which they are all seated; the start; the hunt, in which the stag is haunched by an arrow shot from the bow of an intrepid amazon; the return journey with but a wretched hare, the devil having come to the rescue of the stag. The figures, with the exception of the coracle, which was copied from an ancient tombstone, were taken from Mary 1st of England's Book of Hours—"Mary Sanguinea" in garden parlance! The figures were grown through wire shapes made by a clever smith who lives in the Clogher valley in Co. Tyrone, who is also an expert in ironwork and has made some very fine gates. It is surprising how well the *Cupressus macrocarpa* has lent itself to this topiary work. In passing it may be mentioned that for hardness and durability, combined with quick return, timber from this tree is proving quite one of the best. A pier by the loch shore made from this wood has withstood salt water and gales for more than a decade and a half and is still perfectly sound, whilst the oak beams on the pergola by the house, protected from both, have been frequently renewed in one place or another. It is only to be regretted that this *Cupressus* is not hardy everywhere.

On the house wall itself there are two or three very old and precious plants—the only ones left of a former gardener's efforts. One is a huge lemon-scented Verbena, now known as *Lippia citriodora*. It has a trunk that would do credit to any small tree. The old yellow Banksian Rose flowers beautifully right at the top of the house, and there is a very fine plant of *Mandevilla suaveolens* which has reached the top of the house too and flowers profusely. Of the newer plants *Bougainvillea glabra* is doing well, and there is a lovely shrub some 10 feet to 12 feet high of *Cassia corymbosa*, planted only a few years ago, which is hardly ever out of bloom from summer right on into the winter months. Here also is a very sweet white Banksian Rose which I brought from Spain. *Chianthus puniceus* does well and is always a delight to see; *Campsis radicans* is also growing very fast. Beautiful old Magnolias share the main walls with fragrant Myrtles. Orange trees planted out on the terrace have established themselves and flower and fruit. On warm evenings their delicious scent almost reminds one of Italy.

Near by, at the foot of the terrace wall, are two trees which are especial favourites of mine—one is an Acacia, given me by the late Sir JOHN ROSS of Bladensburg. It is in flower practically the whole



FIG 169 ---MOUNT STEWART OF THE ARDS, CO. DOWN.

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FIG 179 - MILCONOPSIS VIOLACEA AT MOUNT STEWART

year round and is really a precious thing of great beauty. The other and smaller tree is *Psoralea pinnata*—a blue pea-flowered shrub, it has very graceful foliage and a beautiful smooth shiny yellow-brown bark. When in bloom it is literally smothered with blue flowers, which have a delicious fragrance. Close by is a most satisfactory plant of *Fremontia californica*; this shrub also is almost perpetually in flower. Next to it is *Rhododendron Roylei superbum*, into which has been trained *Lapageria rosea*—its large waxy bell-like flowers look so exciting and exotic. Here also luxuriate *Rhododendron fragrantissimum*, R. 'Countess of Haddington' and *Buddleia madagascariensis*, *Fuchsia corymbiflora* and *Genista fragrans*. All the Cestruums were particularly fine this year—*C. Parqui*, *C. elegans* and *C. Newellii*. The plants in the beds of the south garden are encouraged to grow very big, and shrubs are made use of as well. Roses are growing into quite self-respecting trees, such as you see in Spain. Clematis grows over and through large bushes of *Erica arborea*, and *Prunus Pissartii* is covered with *Tropaeolum speciosum*. Clematis also looks lovely grown through standard trees of Wistaria. The shrubs lend themselves to this dual purpose: not only are they lovely when in bloom themselves in spring and early summer, but they display a mass of colour during the late summer and autumn months. *Tricuspidaria lanceolata* is also in the beds, where it has reached most imposing dimensions and provides a good background for large standard greenhouse Fuchsias. *Abutilon megapotamicum*, Tamarisk, Hibiscus and Hydrangeas all find a place, also Honeysuckle and huge Sunflowers and all the other more ordinary herbaceous and annual plants. On the western half of the garden the colours are intended to shade from blood-red into pinks, pale yellows, mauves and purples, also silvery-greys. A very effective plant for this purpose is *Artemisia arborea*, which has been grown into standards. The eastern half is kept for scarlets and orange, with dark prune colours or mulberry and blues. Here *Lobelia cardinalis* and L. 'Huntsman' are very effective. Scarlet Pelargoniums grown as standards and *Tropaeolum speciosum* growing into the *Prunus Pissartii* are very effective here. There are bold groups of flame Kniphofias and some Antirrhinums and Dahlias, more Hydrangeas and masses of large clumps of Sweet Peas. All the beds have a hedge of white Heather—the variety used is 'Hammond's White.'

Round the garden, grown either on the walls or at the foot of them, are the Ginger plants, both the lovely sweet-scented flame *Hedychium Greenii* and the newer white form of Kingdon Ward's, still under number, which is not nearly so effective as its orange kinsman. There is also the aromatic small white-flowered shrub *Diosma vulgaris*. Lapagerias have been planted in many different sites and are doing well. All the Salvias flourish here and make a great effect on the walls, growing many feet in height, and also in the beds, where *Salvia Grahamii*, *S. Greggii* and *S. Pittieri* continue in flower up to Christmas. *Berberidopsis corallina*, *Mutisia decurrens* and *M. retusa*, also *Trachelospermum jasminoides* are doing well, whilst near the little Spanish garden *Brugmansia Knightii*

has wintered out with slight protection, and a fine plant of *B. arborea* in another situation, which eventually died, has left a fine sturdy seedling which is replacing its parent. We have planted some of the more tender Rhododendrons against a shady wall by the Spanish house—*R. Dalhousiae* and its cross *R. Victorianum* and *R. Edgworthii*. *R. Nuttallii* is in the open too, but although doing well it has not flowered yet. *R. megacalyx*, on the other hand, in another situation has flowered very well; so have *R. Lindleyi*, *R. Taggianum* and *R. rhabdotum*. We intend to make free use of this subseries from our seedling beds in the wood. *R. Johnstoneanum*, *R. Maddenii*, *R. bullatum* and *R. crassum* are all growing freely.

On the back of the Spanish summer house, which faces south, we have planted *Bougainvillea glabra* and another species from Australia, *Pentapterygium serpens*, *Bignonia venusta*, *B. jasminoides* and *Abutilon* 'Golden Fleece.'

Two years ago I brought home some plants from Egypt—*Cassia eremophila*, *C. artemisioides*, *Lantana Camara*, *Aloe saponaria* and *Agave villosa*. These are being tried and give the appearance of enjoying themselves in their new quarters.

There is another garden close by the house, but concealed from it—which is a stone garden designed in the form of a Tudor Rose, the inner petals forming the beds. On one side there is an arched walk covered entirely with various kinds of "Mimosa." The Acacias grown comprise *Acacia dealbata*, *A. Riceana*, *A. longifolia*, *A. suaveolens*, *A. juniperina*, *A. Baileyana*, *A. pulchella*, *A. retinodes*, *A. floribunda*, *A. verticillata* and *A. platyptera*. This walk is a rare and refreshing sight when the Acacias are a mass of bloom.

Amongst the shrubs in this garden is a well-grown *Colquhounia vestita*, *Clerodendron foetidum*, *Olearia semidentata*, *Drimys Winteri*, *Cistus purpureus*, *Tricuspidaria lanceolata*, and the charming blue-flowered shrub *Caryopteris Mastacanthus*. There is also a large *Cordyline australis* which was moved from close proximity to the house to its new quarters, as it was a very old and established tree—most fortunately it survived the change. We find the Cordylines grow to a great height and very quickly. *C. indivisa* is certainly the most distinctive, but a slower grower; *C. Banksii* is a useful dwarf form. Of the hardy Palms we grow *Trachycarpus excelsa* and *Chamaerops humilis*, and I have planted an avenue of *Phoenix canariensis*, which I brought from Malaga about seven years ago; the avenue leads to the sea and the Palms are doing exceedingly well, and already give some idea of the effect that they will make some day. They are planted in front of a broad clearing cut to the shores of Strangford Loch. Behind the Palms, planted at the same time, on both sides of the clearing are good trees of *Rhododendron arboreum*; these have grown very well. A mixed hedge of *Cupressus macrocarpa* and Beech, affords the necessary shelter along the eastern and exposed side of the salt waters of the loch. The growth of this hedge has been very remarkable and has enabled the Rhododendrons to make a wonderful show in the

short space of time they have been there. Planted at the end of the clearing, but not so as to impede the very beautiful view of the Mourne Mountains which are seen across the water some 20 to 30 miles off, is a group of *Pinus Pinea*. Plants of *Magnolia grandiflora*, Exmouth variety, are growing near the woodland side; Acacias have made great growth and there are many Cordylines. Arriving from the colder districts in England for Christmas you seem to be in fairyland. Against a noble background of *Abies pectinata* and *Quercus Ilex* and other evergreens you are greeted by *Rhododendron Nobleanum* in full flower and Veronicas in bloom—it is difficult to realize you are in mid-winter in the British Isles. The Nobleanums are followed by the Arboreums—some of the older type have attained a height of upwards of 35 feet—and the trees are a wonderful and unforgettable sight with their rosy red blooms. The Chinese Arboreum *R. Delavayi*, grown in full sun, is the most outstanding of the series, although the later flowering *kermesinum* is not far behind. The large-leaved Rhododendrons are given the shelter of thin woodland and are growing well. Amongst them are *R. Falconeri*, *R. sino-grande*, *R. arizelum*, *R. argenteum* (this early flowering form is often disappointing from being disfigured by weather conditions, but this year it was very lovely). *R. fichtolacteum* is being used for massing, the foliage alone singling it out for this. *R. Macabeanum*, now 3 to 4 feet high in the seedling beds, is about to be planted out in a similar manner, for the fine bold foliage of this species is very promising.

Of the newer shrubs raised from seed *Berberis hypokerina* K.W. 6787 is making a striking plant and a *Lonicera* under number K.W. 7113 has very bright fruits which unfortunately the birds devour speedily.

Amongst other plants growing in various situations are *Sollya heterophylla*, *Camellia reticulata*, a most lovely shrub, *Carpenteria californica*, *Lardizabala biternata*, *Kennedya ovata* and *Plumbago capensis*. Tree ferns grow naturally and no attempt is made to protect the Dicksonias, which are represented by *D. antarctica* and *D. fibrosa*, also *Cyathea medullaris*, which my brother Lord CHAPLIN sent me amongst others from New Zealand this year. Some of these will no doubt require shelter, but they are all making growth since their recent arrival and do not appear to resent the change of climate and situation. *Eucalyptus Globulus* (three trees planted by the late Lady LONDONDERRY some forty years ago) has already reached a height of over 80 feet and flowers and seeds freely. We have planted trees of it everywhere, and many species raised from Australian seeds have also been planted, but it is too early yet to speak of their merits. *Casuarina stricta* and *C. equisetifolia* are two of the Beefwoods which appear to agree with the climate. *Cinnamomum Camphora* and *Neriums* are permanently planted out, and also *Eriobotrya*. The Norfolk Island Pine (*Araucaria excelsa*) is represented by three trees all growing well in sheltered spots. *Cunninghamia sinensis* is growing rapidly and looks like making a very fine tree. *Sophora microphylla* and *S. tetraptera* both ripen their seeds. Amongst the Magnolias

grown are *M. Watsonii*, one of my favourites, for the flower is exquisite both in form and fragrance, *M. Campbellii*, only small plants, alas, as yet, *M. fuscata*, *M. grandiflora*, *M. stellata*, *M. hypoleuca*, *M. Lennei*, *M. obovata*, *M. Delavayi*, *M. Soulangeana*, *M. tripetala*, *M. glauca*, *M. macrophylla* and *M. parviflora*. There is another *Psoralea pinnata*—the child of the one on the terrace and this precocious infant has already outgrown its parent: though only four years old, it must be called a tree. *Brachyglottis repanda* and *Senecio rotundifolius* are here, of which the former flowers freely. *Leptospermums* on the slope of the hill exposed to all the winds except the north have grown into large shrubs. I have planted *Leptospermum Nicholii* in preference to all the others, its blood-red blooms and bronzy foliage are so beautiful. Then there are *Embothrium coccineum* and the Rostrevor type with larger and lighter green leaves and more robust. *Eucryphia pinnatifolia* and *E. cordifolia*, the latter growing with great rapidity and robustness, the former much more dilatory and slow to make a move, but doing well, *Feijoa Sellowiana* and *Geuvina Avellana* (a magnificent specimen I had of this shrub some 25 feet high was blown over this year, but another younger one is doing very well), *Itea ilicifolia*, *Plagianthus Lyallii*, *Lomatia obliqua*, *Olea fragrans* and the Oleanders must all be mentioned. An old specimen tree of *Paulownia imperialis*, 35 feet high, flowered so freely last year, that it encouraged me to plant two more young trees nearer the house. *Drimys aromatica*, the bottle brushes *Callistemon floribundus* and *C. speciosus* are amongst the nicest shrubs; *Eupatorium micranthum* or *E. Weinmannianum*, beloved of butterflies, is lovely in the autumn months; *Clethra arborea* is proving quite at home and *Prostanthera rotundifolia* is being used for a hedge and is a great success. *P. lasianthus* is slow to make headway, but *P. coccinea* under the shelter of a wall is doing well. *Hakea saligna* has grown into a tree and *H. ulicina* is a distinctive free-blooming plant. Every type of Fuchsia is grown; they are especial favourites, flowering as they do all the autumn, and up to Christmas. All the greenhouse varieties and hybrids do well in the open, and species such as *F. cordifolia*, *F. corymbiflora*, *F. Cottinghamii*, *F. excorticata*, *F. parviflora*, *F. procumbens*, and *F. serratifolia* are all grown.

We have tried *Echiums* successfully for the last few years. They grow to a great height, both *Echium fastuosum* and *E. Wildpretii*; so do the various species of *Meconopsis*, *Meconopsis violacea* growing to 8 feet and of a most lovely opal colour. I sometimes think it is really more beautiful than *M. betonicifolia*.

Among the less hardy bulbs *Crinum Powellii* is always a joy in the autumn months, and the Nerines have proved successful, too, under dry walls. *Hippeastrum Ackermanii* is a treasure with its blood-red blooms; so is a beautiful pink *Amar-Crinum*. *Beschorneria yuccoides* on the dry banks is quite one of the best of that type of plant and is always a striking object in form of growth and flower.

Cycas revoluta and a *Rhopala* have stood outside for a number of years.



FIG. 171 — IN THE GARDENS, MOUNT STEWART.

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FIG. 172 -- THE PERGOLA, MOUNT STEWART



FIG. 173 -- IN THE GARDENS, MOUNT STEWART



FIG. 174 --ECHIUMS AT MOUNT STEWART

To face p. 529

Lilies are gradually being naturalized. Some thousands of *Lilium giganteum* have been brought forward and can now be seen in all stages from infants to debutantes!! We also grow *L. superbum*, *L. pardalinum*, *L. Sargentiae* and *L. regale*, which are all intended for this method of growing when sufficient bulbs have been raised.

All these things are, of course, only in their initial stages, and it will be years before they will be able to compete with older gardens; but it is very satisfactory to have been able to prove what a variety of trees, plants and shrubs will flourish in our climate.

Beyond the formal gardens the land inclines upward through undulating grounds and slopes on which were planted towards the close of the eighteenth century many species of Oak, including magnificent numerous specimens of *Quercus Ilex*. *Pinus insignis* is also a feature here and a prehistoric Arbutus tree (*A. Unedo*), to judge by its size and height; there is also the inevitable Cork tree. No self-respecting Irish garden of a certain date was considered complete without one, and we are fortunate in many massive Silver and Douglas Firs.

Round a nicely situated medium-sized lake in the grounds are grouped Azaleas, Eucalyptus trees and *Cornus sanguinea*. Here the flame-coloured *Salix britzensis* is really lovely reflected in the calm waters on a winter morning. Hydrangeas, too, are seen at their best. They colour naturally the very deepest blues from azure to purple tints. All the bog Primulas flourish here as well as *Iris Kaempferi*, Kniphofias and Schizostylis, both the type and 'Mrs. Heggarty'; Sparaxis and Spiraeas complete the picture. At the back of the lake is a steep little hill, which was an open space of grassland twelve years ago. Now dignified Italian Cypresses (*Cupressus sempervirens*) invite you to ascend the roughly paved paths until you reach a square enclosure at the summit; at either corner stand two towers; the retaining wall facing south is broken by very large Italian terracotta pots, and seats run along the wall. The view from here is one of especial charm and peace. Eucalyptus trees, Ilex and Pine are on every side, so it is impossible to realize that winter is with us, there is so much evergreen. Indeed in winter the deciduous trees lend an additional charm to the surroundings by the architectural beauty of their leafless branches. In mid-summer there is so much green that everything is rather too lush and heavy—the tender greens of spring and the colours of autumn are far more attractive.

Looking south across the garden lake in which in spring are mirrored the many colours of Azalea and Rhododendron, and on calm bright autumn days Hydrangeas reflect their blue and opal tints, your eye travels across the tall spires of the Pine trees to the salt waters of Strangford Loch, and beyond again are the distant shores of the ancient kingdom of Mourne, where the Mountains of the Mist rise up from the coast and frame the view. The Mourne Mountains are almost as unreal in their beauty as they are capricious in their moods. They seem to appear and disappear at will. These hills of dream seen in all the glory of the setting sun, a rosy purple splendour, are unforgettable.

In mid-winter this view is perfect, as the sunsets are exquisite. This spot is named "Tir-n-an-og"—"the land of the ever young." It is intended as a burial ground—not a place of mourning and sorrow, but a joyful spot of hope and rest and peace. Immediately below the wall are massed *Leptospermums*, *Olearia semidentata*, *Rhododendrons*, *Azaleas*, with many other trees and shrubs; *Mesembryanthemums* creep down the walls, and prostrate *Rosemary*. Here, too, *Brachysema acuminatum* is flowering well. Blue *Cinerarias* have gone quite crazy, and are seeding themselves by the hundred in the ground and in crannies in the wall. Greenhouse *Cyclamens* are also growing thickly. *Genista fragrans* is a delight, both on the wall and on the open slope. Here also grow a profuse number of different Heaths: the large tree Heaths, *E. arborea*, *E. australis*, *E. mediterranea*, and *E. codonodes*, would grow into a small forest if not ruthlessly checked; indeed, we have one ancient tree (I can call it nothing else) of *E. arborea* growing alongside the carriage drive which has attained a height of 20 feet or more and has a really thick trunk. The old original garden is at least a mile from the house and about a quarter of a mile from Tir-n-an-og. It comprises 10 acres inside most remarkably high walls. In fact there are three walled gardens. The walls are built of massive stones and all the south sides are faced with brick. Across one half of one of the walled gardens which is traversed by a carriage drive is a very old Beech hedge of huge dimensions—a grand shelter but a terribly greedy form of protection for a kitchen garden.

The walled gardens produce fruit of all kinds, from Apricots, Peaches, Figs and Nectarines to all the bush and soft fruits. What used to be the old pleasure garden is now devoted to fruit and flowers, where now plants are cultivated or grown for picking. This garden in design is partly Elizabethan and partly Italian.

Here also is the Rose garden, where the walls run back on three sides of a square. Stone pillars frame the square, making a pergola all round the Rose beds, which are in a sun-ray pattern in the centre. This garden is backed by an old circular stone house which is now the dairy. In one of the greenhouses there is a wonderful old Vine. We came across this inscription concerning it in an old garden book:

"HISTORY OF THE WHITE SYRIAN GRAPE.

"Syrian Vine growing in the west pine stove in the garden of the Marquess of LONDONDERRY.

"This famous vine was planted in the year 1769 by WM. ADAMS, gardener, in the pine stove that stood in the castle garden, Newtownards. It was taken up in the year 1870 and replanted by JAMES WALLACE, gardener, where it now stands in the west pine stove at Mount Stewart. Its principal limbs are regularly trained . . . and suspended from the roof sash bearers. Exclusive of its fruit wood, it runs 40 ft. in length, by 20 ft. in depth, and when in bearing covers 800 square ft. I measured this vine and counted each bunch of fruit on the 29th July,

1800—278 bunches from 8 to 13 inches deep and counting each bunch one with another to be 4 lbs., it would produce 1,112 lbs. which if sold, at 2s. 6d. per pound, would bring £139—when this was written, the fruit was not fully swelled nor ripe.”

It still bears enormous bunches of its white grapes, which are very sweet although they have not the flavour of the newer Muscat. This old white Syrian Vine is, I believe, older than the black Hamburgh Vine at Hampton Court. The care bestowed on this Vine, and the manner in which the original owners of Mount Stewart laid out the Demesne and planted the many beautiful and uncommon trees and shrubs of their day, including the two very fine Oaks of which a board informs you that they were planted by the famous statesman Viscount CASTLEREAGH himself, and the discovery in an old book that two Cedars of Lebanon that were struggling for light and space in the midst of a plantation of self-sown trees, such as Sycamores, from which we freed them, were grown from seeds brought by a great-uncle of my husband's from the actual Cedars of Lebanon, prove that successive owners of Mount Stewart loved and cherished the place and each in turn tried to embellish its natural beauties. For us who are reaping the rich harvest that they so ably sowed, it is not only a pleasure to carry on the tradition, but a duty to endeavour to leave the place more beautiful and rich in trees and shrubs than when it came into the orbit of our lives. The late Lady LONDONDERRY wrote this quotation from Horace in a “Folly” at Mount Stewart called the Temple of the Winds. It is, I feel, a fitting finish to this article :

Ille terrarum mihi præter omnes angulus ridet.

FIG MOSAIC.

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A FIG tree of the variety White Ischia, growing in a pot and under glass at this Station, developed leaf symptoms similar to those of fig mosaic, a virus disease that has been described in California by I. J. CONDIT and W. T. HORNE.* In August last, Dr. M. SHAPOVALOV, from California, when visiting Cheshunt, saw diseased material and considered the disease to be the same as that in California, and another visitor, Dr. J. G. BALD, at once recognized the symptoms as being similar to those of the fig mosaic that occurs in Australia. In this article the symptoms of fig mosaic are described and the present knowledge of the disease briefly summarized.

The fig tree that has been under observation at Cheshunt has shown leaf symptoms of two types. Some leaves have exhibited irregular yellowish-green blotches, often with paler coloured margins and up to half an inch or more across, distributed on the leafblade with little relation to the veins (see the left-hand smaller leaf in fig. 177), while other leaves have shown pale green spots or bands, usually associated with the larger veins (see the two larger leaves in fig. 177). These latter spots often have narrow, reddish-brown margins. The coloured areas are quite superficial and are not seen, or are inconspicuous, when the lower surface of the leaf is examined. Many leaves on the tree appeared quite normal and the distribution of the mottled leaves was rather irregular. Usually on any one twig the leaves were either all of a healthy appearance or mostly diseased (as in fig. 177), but there were more branches with abnormal leaves on one side of the tree than the other. The leaves were not noticeably deformed (except one leaf developed on a cutting taken from the diseased tree). An occasional fruit showed a few spot-like markings resembling those illustrated by CONDIT and HORNE, but the tree was not seriously affected.

In California similar leaf symptoms have been observed, but in addition distortion of the leaves is often quite severe, the fruit is frequently spotted, and there may be premature fall of both leaves and fruit. It was found from an examination of the many varieties of fig grown at the Citrus Experiment Station that there were very marked differences in varietal susceptibility to mosaic. One variety examined, an entire-leaf caprifig form of *Ficus palmata* Forsok, was considered to be immune, others were found to be somewhat resistant,

* A Mosaic Disease of the Fig in California. *Phytopathology*, XXIII, 887-96, 1934.



FIG. 175.—IN THE GARDENS, MOUNT STEWART



FIG. 170--THE GARDEN STEPS AND PERGOLA, MOUNT STEWART.

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and White Ischia and Celeste varieties were stated to be among the more susceptible types.

Nothing definite is known regarding the method by which the disease is spread in Nature. Insect agency is probably responsible for its dissemination, for, as is well known, insects are able to transmit many other virus diseases with great efficiency. No particular insect has, however, yet been implicated, though in California the fig scale insect, *Lepidosaphes fici* Sign., and the mite, *Eriophyes fici* Ewing, have been suspected. Again in California, experiments have shown that the disease can be transmitted by grafting, and that it reappears in cuttings taken from diseased plants, but seedlings raised from seed taken from mosaic-affected parents showed no signs of disease. At Cheshunt a cutting taken from the mosaic-affected tree reproduced the disease.

Fig mosaic, though widely distributed, cannot be considered to be a very serious disease. In California, according to CONDIT and HORNE, it is usually not sufficiently serious to alarm the growers, in Tunisia it is stated to be widespread, but of no economic importance, and R. J. NOBLE * reported fig mosaic as widespread but generally unimportant in New South Wales during 1932-3. Although there is no published record of fig mosaic occurring in Great Britain, the disease is fairly common in this country. Mr. F. J. CHITTENDEN has known the disease at Wisley and elsewhere for at least twenty years, and Dr. W. F. BEWLEY has observed it in Guernsey, where it appeared to do damage when cultural conditions were unfavourable.

Fig mosaic is, then, another virus disease, possibly previously attributed to a bad soil or other causes, for which gardeners and others should keep a watch, and though at present no definite control measures can be advised it would certainly be well to see that stocks are never propagated from any trees showing the slightest signs of the disease, for propagating from mosaic-affected trees would multiply the disease, which might gradually assume greater importance.

* Abstract in Rev. Appl. Mycol., XIII, 356, 1934.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1935.

Aster 'Agnes D. Findlay.' A.M. October 11, 1935. Raised and sent by the Director, Royal Horticultural Society. Amellus type. Height 2 feet, erect, bushy habit. Flowers single, 2 to 2½ inches diameter, pale rosy-lavender, disc golden-yellow. Mid-October flowering.

Aster 'Alderman Vokes.' A.M. October 11, 1935. Raised by Mr. H. V. Vokes and sent by Messrs. Barr, London. Novi-Belgii type. Height 3½ feet, erect habit. Flowers semi-double, 1⅝ inch diameter, clear pale old rose, disc yellow, very freely produced. Early October flowering.

Aster 'Blue Baby.' H.C. October 11, 1935. Raised and sent by Messrs. Simmonds, Kings Langley. Novi-Belgii type. Height 15 inches, erect, habit compact. Flowers single, 1½ inch diameter, pale blue, freely produced. Early October flowering.

Aster 'Daphne.' H.C. October 11, 1935. Raised by Mr. H. V. Vokes and sent by Messrs. Barr, London. Novi-Belgii type. Height 1½ feet, very compact habit. Flowers single, 1½ inch diameter, pale pinkish-mauve, disc pale yellow. October flowering.

Aster 'Mabel Blakey.' H.C. October 11, 1935. Raised and sent by the Director, Royal Horticultural Society. Amellus type. Height 20 inches, of erect, bushy habit. Flower 1¾ to 2 inches diameter, clear rose-pink, disc golden-yellow. Early October flowering.

Aster 'Palmyra.' A.M. October 11, 1935. Raised and sent by Mr. T. Bones, Cheshunt. Novi-Belgii type. Height 4 feet, compact, erect habit. Flowers semi-double, 1½ inch diameter, rose-pink, freely produced. Early October flowering.

Aster 'Red Rover.' A.M. October 11, 1935. Raised by the Hon. Vicary Gibbs and sent by Messrs. Wood, Taplow. Novi-Belgii type. Height 3 feet, vigorous. Flowers semi-double, 1½ inch diameter, bright rosy-red, freely produced (H.C. 1930).

Aster 'Remembrance.' A.M. October 11, 1935. Raised by Mr. H. V. Vokes and sent by Messrs. Barr, London. Novi-Belgii type. Plant dwarf, compact, 18 inches tall. Flowers single, 1½ inch diameter, pale pinkish-mauve, disc golden-yellow. Late October flowering.

Aster 'Ring of Roses.' A.M. October 11, 1935. Raised and sent by the Hon. Vicary Gibbs, Elstree. Novi-Belgii type. Height 3 feet, bushy. Flowers semi-double, 1½ inch diameter, bright rich rose, freely produced (H.C. 1932).

Aster 'Voke's Pink.' H.C. October 11, 1935. Raised by Mr. H. V. Vokes and sent by Messrs. Barr, London. Novi-Belgii type. Height 3 feet, compact, erect habit. Flowers single, 1½ inch diameter, clear rose-pink, disc golden-yellow, freely produced. Early October flowering.

Aster 'White Button.' H.C. October 11, 1935. Raised and sent by Mr. E. Ballard, Colwall. Novi-Belgii type. Height $2\frac{1}{2}$ feet, vigorous and freely branched. Flowers semi-double, $1\frac{1}{4}$ inch diameter, white, does not become stained, free flowering. Mid-October flowering.

Carnation 'Joyce.' A.M. October 8, 1935. Shown by the Farnham Royal Nurseries, Slough. Perpetual flowering. Plants of free and vigorous growth with good strong flower stems and calyces. Flowers large, with full centres, clove scented; petals cut.

Carnation 'Vera.' A.M. October 8, 1935. Shown by the Farnham Royal Nurseries, Slough. Perpetual flowering. Plants vigorous, of bushy habit and free growth, flower stems and calyx strong. Flowers large, with full centre, light rose-pink, somewhat scented; petals cut.

Chrysanthemum 'Appert.' A.M. October 8, 1935. From Messrs. Luxford, Sawbridgeworth. A large, light golden-bronze incurved Japanese variety with long, slightly curled florets of medium breadth.

Chrysanthemum 'Croesus.' A.M. October 8, 1935. From Mr. J. A. Barrell, Bridgwater. A bright orange-bronze decorative variety with broad florets and a pale yellow reverse.

Chrysanthemum 'Indiana.' A.M. October 8, 1935. From Messrs. J. & T. Johnson, Tibshelf. A dark crimson decorative variety of good substance.

Chrysanthemum 'Sincerity.' A.M. October 8, 1935. From Messrs. Johnson. A soft pink decorative variety, slightly incurving at the centre and having a silvery reverse.

Chrysanthemum 'Westbourne.' A.M. October 8, 1935. From Messrs. Johnson. A rich crimson decorative variety with an old gold reverse. The flowers are of good substance and medium size.

Gentiana \times Macaulayi, 'Kidbrooke Seedling.' A.M. October 15, 1935. From R. Olaf Hambro, Esq., Forest Row. The name *G. \times Macaulayi* is used to denote all hybrids raised from *G. sino-ornata* \times *G. Farreri*. The flowers of the present plant are rich deep blue, striped inside with silvery white and externally with greenish white and indigo. The habit is compact and the flowers are very freely produced.

Gypsophila Oldhamiana. A.M. October 8, 1935. From Messrs. Watkins & Simpson, Drury Lane, London, W.C. This is a useful, late-flowering Japanese species, 2 feet in height and of compact habit. The growths are copiously branched and bear numerous bright lilac flowers.

Physalis Franchetii gigantea. A.M. September 25, 1935. From Mr. Amos Perry, Enfield. A handsome variety of the well-known 'Winter Cherry.' The deep orange-red fruiting calyces are very large and of firm texture.

Vuylistekeara \times 'Anglia.' A.M. October 15, 1935. Raised and exhibited by Messrs. Charlesworth, Haywards Heath. A pleasing hybrid with a spike of three flowers, bright crimson-scarlet, the wide labellum bordered with light rose. *Miltonioda* \times *Harwoodii* \times *Odon-tonia* \times 'Baroness Schröder.'

FRUIT PESTS: THEIR EFFECT AND DETECTION.

By G. FOX WILSON, N.D.H., F.R.E.S.

(Read October 8, 1935; Mr. E. A. L. LAXTON, V.M.H., in the Chair.)

THE fact that there is an enormous annual loss of fruit as a result of the attacks of insects behoves the grower to become familiar with the signs of attack and to recognize the types of insects which are responsible for the injury.

The presence of some plant-feeding species of insect only too frequently becomes first apparent to the grower from the unhealthy condition of the host plant. Knowledge of the early signs of attack is of paramount importance in pest control work, and too little emphasis is often laid upon the necessity of making a critical scrutiny of a particular injury. It is desirable for the plantsman to recognize from a study of definite signs the insects which are responsible for producing them so that he may be armed with knowledge as to the particular pest present on his plants. The average horticulturist has not undergone any training in entomology, and many amateurs must necessarily depend on the signs of injury to enable them to discover that some pest is present. There are doubtless some who consider themselves competent to differentiate between species of insects and other animal organisms from an examination of the type of injury produced by them. The determination of the causal organism solely by means of the signs of attack is scientifically inaccurate, though one may say that certain types of damage are correlated with certain types of insects.

The Plant as a Factor.—The plant constitutes an individual of which all parts maintain due and appropriate order with respect one to another, and serious injury to one part, more especially to the root, the stem or the foliage leaf, affects the entire plant. On the other hand, injury to such organs as the flower, the fruit and the seed, may not unduly affect the whole plant. It is for this reason that the plant should be studied as a factor, for it is the plant that must receive primary consideration by the grower.

It is necessary to appreciate the fact that every part of a plant is liable to be attacked by one or more species of insect. Not only the aerial portions—the stem, shoots, buds, leaves, flowers, fruits and seeds—may be attacked, but also the underground portions—the roots, stems, tubers, bulbs, corms and rhizomes. A knowledge of the signs of attack on the several parts of the plant is frequently the means of preventing a serious infestation by a particular pest, as instant recognition of injured tissues is an important factor in pest control.



FIG. 177 - FIG MOSAIC DISEASE.

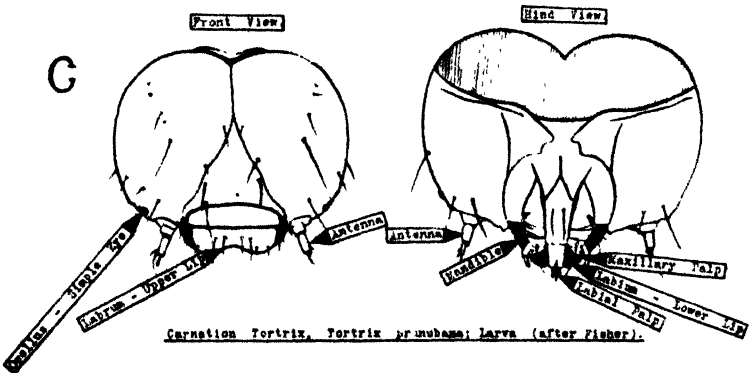
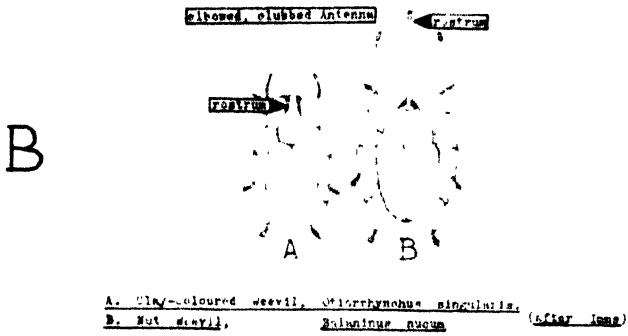
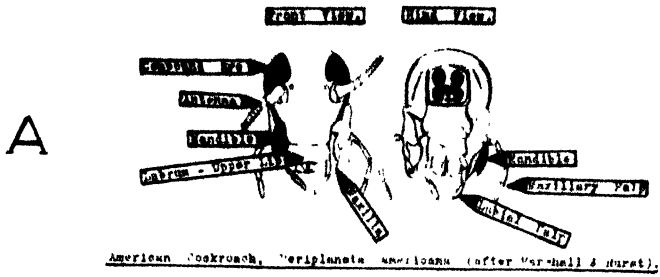


FIG. 170 TYPES OF MOUTHPARTS OF BITING INSECTS



FIG. 180. INJURY DONE BY BITING INSECTS.

- A. Leaf-eating Weevil (*Phyllobius*) on Pear.
- B. Vine Weevil on *Rhododendron*.
- C. Winter Moth on Apple

[To face p. 537.

The Apple will serve as an illustration of a plant in which every part is liable to be attacked by insect pests (fig. 178).

The injury done by insects to the tissues of plants may often result in secondary invasion by mites, by saprophytic insects, and by bacteria and fungi, all of which are capable of extending the initial injury and masking the effect of the primary agent.

Insects damage plants both directly and indirectly—the more important effects of their attacks being set out in the Table on p. 538.

Before measures for controlling insect pests can be applied with intelligence, it is necessary (1) to become acquainted with the life history of the particular organism, and (2) to have some knowledge of the method of feeding.

(1) *Life History*.—Insects undergo a series of changes or metamorphoses, which may be complete or incomplete. Complete metamorphosis comprises four stages—the egg, the larval (otherwise known as the caterpillar, grub or maggot stage), the pupal or chrysalis, and the adult stage. Examples of insects which have a complete metamorphosis are: butterflies and moths, beetles and weevils, two-winged flies, sawflies, gall-wasps, bees, wasps and ants. Insects with incomplete metamorphoses, for instance earwigs, thrips, capsid bugs, aphides, psyllids, aleurodids and coccids, have no true pupal stage and, although some remain inactive for a period prior to the adult stage, many continue active throughout their entire life cycle.

The stage in which the injury is committed is important, for it is found that some species are destructive *only* in the larval stage (Winter, Tortricid and other moths); some as adult insects only (Leaf-eating Phyllobius weevils, and wasps); while others are injurious in both the larval *and* the adult stages (Capsid bugs, cockchafer, Raspberry beetle, bark beetles, and so on). Remedial measures are generally taken against the active feeding insect only. Preventive measures, on the other hand, may aim at destroying the eggs of many pests, for instance Capsid bugs, aphides, psyllids, certain moths, and red spider mite, by means of egg-killing washes. Insects which undergo a true pupal stage are quiescent during this period, which is passed in some sheltered position in the soil or elsewhere, and control measures are not generally advocated against the insect during this period of its life cycle. There are exceptions, as for instance when pupation and/or overwintering quarters are provided in the form of hay and corrugated-paper bands placed round the stems of fruit trees for the express purpose of encouraging the larvæ of certain moths, *e.g.* Codling, to seek and to employ such positions for pupation and/or hibernation.

(2) *Feeding Habits*.—Insects may be classified for our present purpose according to their method of feeding, which consists either of biting the tissues of plants by the aid of their mandibles, or sucking the cell contents by means of their elongated piercing mouthparts. It is essential to know the method of their feeding before effective control measures can be applied. With certain exceptions, such as those insects which mine the leaves, tunnel and bore into stems and

TABLE I.

I.—DAMAGE BY BITING INSECTS.	II.—DAMAGE BY SUCKING INSECTS.
A. <i>Direct Damage.</i>	A. <i>Direct Damage.</i>
1. Loss of assimilative tissue, thereby hindering food formation and growth (Leaf-eating Insects).	1. Abstraction of cell sap and chlorophyll, thereby lowering vitality and causing wilting, discoloration (chlorosis) and distortion of foliage and flowers, gall-formation, and proliferation and 'blindness' in buds.
2. Lowered vitality due to strain imposed on plants in producing new growth.	2. Abstraction of cell contents from roots, thereby reducing water- and nutrient-absorbing tissue (Root Aphides).
3. Destruction of the (i) floral (corolla and calyx), and (ii) reproductive organs (anthers and pistil) thereby lessening chances of : (a) pollination and } Earwigs, Blossom (b) fertilization } beetles and weevils.	3. Hindrance of the passage of elaborated food materials by the tapping of conductive tissue and the severance of veins (Capsid Bugs, Aphides).
4. Reduction in the amount of stored food—water and elaborated food materials—in aerial and subterranean portions.	4. Laceration of epidermal and sub-epidermal tissues.
5. Reduction in the amount of conduction tissue (Goat and Wood Leopard moths, Bark beetles).	5. Injection of toxins during process of feeding, thereby inducing gall-formation.
6. Hindrance of the passage of elaborated food materials and reduction in the amount of assimilative tissue (Leaf-mining Insects).	
7. Destruction of roots, thereby reducing water- and nutrient-absorbing tissue (Cockchafer and weevil larvæ).	
8. Destruction of buds, thereby reducing growth and producing distortion, proliferation and 'blindness' (Bud moth).	
9. Accumulation of elaborated food materials due to a localized stimulus (Gall-forming Insects).	B. <i>Indirect Damage.</i>
10. Destruction of seeds, thereby reducing fertility ; and reduction in the amount of reserve food, thereby lessening germinating powers.	1. Wounding of tissues, thereby producing lesions through which bacteria and fungi enter (Canker and Woolly Aphis).
	2. Transmission of Virus diseases.
	3. Deposition of 'honeydew' by Aphides, Aleurodids and Coccids on the foliage thereby reducing the amount of assimilative tissue and preventing respiration ; in addition, the effect of producing a medium favourable to the growth of certain fungi (e.g. 'Sooty Moulds').
B. <i>Indirect Damage.</i>	
1. Wounding of tissues allowing entrance and extended invasion of tissues by bacteria and fungi.	
2. Transmission of Virus diseases (?).	

shoots, and live in the soil, biting insects are controlled most satisfactorily by means of a stomach poison, *e.g.* arsenate of lead, which is applied to the foliage in the form of an even deposit of arsenical particles so that the insect will swallow the poison with its food. Some care has to be exercised in the application of such washes so as to avoid the danger of the poisonous wash falling on to vegetables and herbs which may be growing beneath fruit trees, and to refrain from spraying fruit trees in blossom owing to the danger of poisoning bees and other pollinating insects.

Sucking insects pierce the tissues of plants and suck the sap or tap the food-conducting channels. As it is not possible to poison their food the method employed is to wet the insects thoroughly with a contact wash (*e.g.* nicotine and soap, Derris or Pyrethrum extracts, or oil emulsions) in order to suffocate them by blocking the spiracles or breathing pores, which are arranged along the sides of the body, or to paralyse the nervous system.

Mouthparts.—It is necessary to consider in some detail the mouthparts of insects in order to appreciate the effect that they have on the plant. Reference has already been made to the main types of mouthparts, namely (A) Biting or Mandibulate, and (B) Sucking or Haustellate. Various modifications of the mouthparts occur according to the food habits of the particular insect, but such are of fundamental importance only to the systematist for purposes of classification.

(A) *Mandibulate Mouthparts.*—Insects with biting mouthparts are responsible for mechanical injury to plants by wounding and eating portions of them (fig. 179).

It is sufficient here to mention only the main organs which are primarily responsible for injuring plant tissue. The chief organs are the *Mandibles* or anterior pair of jaws, which are used for cutting and crushing the food, and the *Maxillae* or posterior and secondary pair of jaws, which act as accessory organs for holding the food and assisting in the mastication of it. These two organs lie between the fixed upper lip or *Labrum* and the movable lower lip or *Labium*. There are slender organs—the *Palps*—which are attached to the base of the *Maxillae* and *Labium* and are sensory organs (fig. 179A).

In weevils belonging to the family *Curculionidae*, for instance the clay-coloured weevil, *Otiorrhynchus singularis* Linn., and the Nut weevil, *Balaninus nucum* Linn., the frons and vertex are prolonged anteriorly to form a rostrum (fig. 179B). In weevils with long proboscides, the rostrum is frequently more developed in the female, and its function in this sex is often that of a boring instrument used for piercing holes in buds (*Anthonomus cinctus* Kollar) and fruits (*Balaninus nucum* Linn. in nuts, and *Rhynchites aequatus* Linn. in Apple fruits) for the deposition of the eggs.

In the larval stages of such insects as moths, beetles and weevils, and sawflies, all the organs with one exception—the *Mandibles*—are reduced considerably and some are vestigial (fig. 179C). In the larvæ of moths, the *Labium* is modified, and in the middle portion there

is to be found a slender projection—the *Spinneret*—which has at its apex an external opening which leads to the silk glands.

The silk which is secreted by these larvæ is used for several purposes, namely :

- (i) For spinning the cocoon which encloses the pupa.
- (ii) For spinning webs and "nests," e.g. the larvæ of the Lackey *Clisiocampa neustria* Linn., and the Apple Ermine moths, *Hyponomeuta padella* Linn., and the 'Tent Caterpillars' which occur on forest and fruit trees in the United States and Canada.
- (iii) For tying together the leaves of plants and for rolling the foliage, e.g. some species of Tortricid moths (fig. 181).
- (iv) For descending from the branches to the soil where pupation takes place (fig. 181).

(B) *Haustellate Mouthparts*.—Insects with sucking mouthparts may be responsible not only for mechanical injury but also for a physiological injury which follows as a result of their feeding (fig. 183).

There is some similarity in structure between the mouthparts of all Hemipterous insects—the mouthparts being adapted for piercing and sucking. The *Mandibles* (M) and the *Maxillae* (MX) are in the form of stylets which rest in the elongated, grooved *Labium* (LBM) or lower lip (fig. 182). The stylets are hollow, bristle-like structures and are capable of protrusion and retraction by the aid of muscles. The Mandibular stylets (M) form the anterior (outer) pair and, although usually free, they may be closely interlocked as in *Lygus* Capsid bugs. The Maxillary stylets (MX) form the posterior (inner) pair, and each tapers to a fine point. They are grooved along their inner sides to form two extremely fine tubes—the dorsal one functioning as the suction canal (SC) which receives the saliva which is forced down the ventral tubes or salivary ejection duct (EC). The stylets are enclosed almost entirely by the Labial sheath or rostrum (LBM), which is dorsally grooved for their reception. At the base of the *Labium*, the groove is roofed over by the *Labrum* (LBR) or upper lip.

In certain Aphides, the saliva dissolves a passage for the stylets through the cell walls causing plasmolysis and dissolution of the cell contents and is known, also, in some cases to transform starch into sugar. It depends both on the species of insect and the host plant as to the regions which are tapped during the process of feeding.

With Capsid bugs, a physiological injury follows as a result of their feeding through the injection of a toxin which, when it enters the cells, destroys the tissues or brings about abnormal growth. The effect of their feeding is, therefore, a chemical rather than a mechanical one, for the injection of the irritant from the salivary glands has a violently toxic effect on plant cells.

The mouthparts of Thrips vary somewhat from those of Hemipterous insects. In Thysanopterous insects, there is no evidence to show that the salivary excretion has any toxic effect on plant cells. The

leaf injury consists of necrosis of a patch of mesophyll cells lying beneath a gash in the epidermal cells. Such patches are scattered and isolated except when the infestation is severe, when they become confluent. There is no puncturing or rasping of the epidermis, but a gashing of the epidermal cells by the pickaxe-like movements of the single, left *Mandible*—the right *Mandible* being vestigial—which is sufficiently long only to gash the outer epidermal wall. The inner wall of the mesophyll cells is broken down by similar movements of the longer, protruded maxillary laciniae. When feeding, the trough-like mouth-cone is applied to the surface of the plant, the stylets are driven down into the tissues, and the cell sap is pumped up by means of the action of the pharyngeal muscles. The preference shown for the undersides of the leaves is due to the greater thickness of the upper epidermal layer.

Having described briefly the main types of mouthparts found in insects, it is necessary to consider some other body organ which is directly responsible for injury to plant tissue, namely the *Ovipositor*.

Confining our attention to fruit pests, there are two groups of insects, namely the Sawflies (*Tenthredinidae*) and the fruit-flies (*Trypeneidae*), which possess ovipositors capable of inflicting injury to plant tissue.

Sawflies (Tenthredinidae).—The female is provided with a saw-like ovipositor capable of producing lesions in stems, leaves and flowers into which the eggs are deposited. The 'saws' or *terebrae* are toothed and form an ideal wedge for splitting the epidermis and lacerating the tissues (fig. 184A). During the operation of oviposition, the saws move alternately, one being thrust forward while the other is withdrawn until a cavity of the required depth is formed.

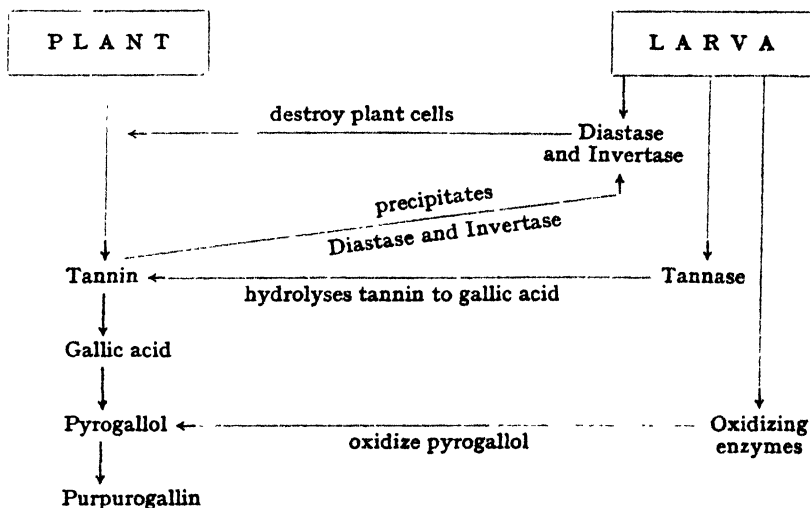
Fruit-flies (Trypeneidae).—The female fly possesses a prominent, horny ovipositor (fig. 184B), which is pushed down into the skin of the fruit. The puncture becomes filled with the escaping cell contents which, on drying, form a hardened plug. The number of punctures is no indication as to the number of eggs laid, for frequent puncturing occurs without oviposition (fig. 184C).

Our fruit trees are free from the attacks of 'fruit-flies,' but fruit-growers in other countries are less fortunate. The Apple maggot, *Rhagoletis pomonella* Walsh, is an important pest in the eastern United States and in Canada, while the well-known Mediterranean fruit-fly, *Ceratitis capitata* Wied., is an important pest of many fruits in tropical and sub-tropical regions.

Other injuries to fruit are due to the attacks of gall-midges (*Cecidomyiidae*) and 'gall-wasps' (*Cynipidae*), and to the excretion of 'honeydew' by certain types of sucking insects, more especially aphides, aleurodids (white flies), and coccids (scale insects).

Gall formation.—The production of galls appears to be due to the larva of the gall-forming insect which, on hatching, gives the stimulus for an abnormal growth by its presence as a moving body, by its feeding, or by its ejection of irritating fluids.

The chemical explanation of gall-formation has been made by NIERENSTEIN, who reaches the conclusion that the relationship between the gall-producing larva and the plant may be regarded as one of inter-compensation. SCHEELE in 1876 made some observations, which have been confirmed recently, that *freshly collected* galls produce gallic acid from gall infusions, and that old galls are not capable of inducing this reaction.



The production of gallic acid by freshly collected galls obviously shows that the plant cells contain Tannase and, at the same time, suggests that Tannase is present in the gall-forming larvæ and not in the galls themselves. The larva lives on the plant by the production of Diastase and Invertase. This is counteracted on the part of the plant by an increase of Tannin, which is known to precipitate both these enzymes. The decisive action, however, remains with the larva, since Tannase destroys Gallotannin. The accumulation of gallic acid thus produced is also effectively disposed of by the larva as shown by NIERENSTEIN in 1919 when he found that Dryophantin is a glucoside of Purpurogallin, an oxidation product of gallic acid. The suggestion is, therefore, that the inter-relationship between the gall-producer and the plant is parasitic, the initial action of the larva being counteracted on the part of the plant by the production of Tannin. I am indebted to Dr. NIERENSTEIN for permission to quote his remarks at length and to publish his diagram.

The term "gall" is so often loosely applied that any abnormality in growth, for instance leaf-curl set up by some aphides and the tumours or pseudo-galls produced by Woolly Aphis (fig. 185), are called galls. The misuse of the term is unfortunate, and it is preferable to restrict the term "gall" to those abnormal growths which are produced as a result of an attack of *internal* parasites, namely to the larvæ of gall midges (*Cecidomyiidae*), to "gall-wasps" (*Cynipidae*), and

to certain aphides which live *within* the tissues of plants, for example, the *Chermesidae*, some species of which produce galls on coniferous trees.

Honeydew.—Many Homopterous insects—aphides, white flies (Aleurodids), suckers (Psyllids) and scale insects (Coccids)—excrete a sweet, sticky fluid called 'honeydew,' which drenches the leaves of infested plants and provides a medium favourable to the growth of 'Sooty Moulds'—the presence of which hinder the normal functions of the leaf—assimilation and respiration.

Honeydew is excreted through the anus—the cornicles or so-called honey-tubes of aphides are not the exit ducts of this substance, but the excretory ducts of a waxy fluid which in all probability acts as a protective covering against predaceous enemies.

The composition of 'honeydew' or excrement depends both on the species of plant and aphid concerned, and is in close relationship to the composition of the cell sap and the digestive processes of the insect. Certain insects, more especially ants, but also bees and wasps, visit aphid- and scale-infested plants to feed on the 'honeydew.'

My thanks are due to Mr. F. C. BROWN (Wisley) for the photographs which illustrate this paper.

SOME INSECT PESTS OF HARDY FRUITS GROUPED ACCORDING TO THE TYPE OF MOUTHPARTS AND THE PART OF THE PLANT ATTACKED.

A. *Mandibulate (Biting) Insects feeding openly on aerial portions—stems, shoots, foliage, flowers and fruits.*

Ground or Carabid beetles	Strawberry.
Garden Chafer, adult	Apple, Pear.
Lackey moth, larva	Apple, Cherry, Pear, Plum.
Vapourer moth, larva	Apple, Pear, Plum.
Magpie, moth larva	Currants, Gooseberry.
Mottled Umber moth, larva	Apple, Cherry, Pear, Plum.
Winter moth, larva	Apple, Cherry, Pear, Plum, Quince, Gooseberry.
Green Pug moth, larva	Apple, Pear, Plum.
Tortrix moths, larvæ	Apple, Cherry, Pear, Plum, Currants.
Leaf-eating (Phyllobius) weevils	Apple, Pear, Plum.
Sawfly, larvæ	Currants, Gooseberry.
Sawfly, 'slugworms'	Cherry, Pear.

B. *Mandibulate Insects feeding on aerial portions but hidden in stems, shoots, mined and rolled foliage, flower buds and fruits.*

Wood Leopard moth, larva	Apple, Cherry, Pear.
Clearwing moths, larvæ	Apple, Currants.
Raspberry beetle, adult and larva	Blackberry, Loganberry, Raspberry.
Codling moth, larva	Apple, Pear.
Bud moths, larvæ	Apple.
Pith moth, larva	Apple.
Tortrix moths, larvæ	Apple, Pear, Plum, Currants, Goose- berry.
Blister moths, larvæ	Apple, Pear, Nuts.
Leaf-mining moths, larvæ	Apple, Cherry, Plum, Blackberry, Loganberry, Raspberry.
Blossom weevil, larva	Apple, Pear.
Nut weevil, larva	Nuts (Cob, Filbert and Hazel).
Bark beetles, adults and larvæ	Apple, Pear, Plum.
Shot-hole Borers, adults and larvæ	Apple, Pear, Plum.
Gall-midge, larva	Pear.
Sawflies, larvæ	Apple, Plum and Damson.

C. *Mandibulate Insects feeding below ground on roots and underground stems.*

Cockchafer, larva	Apple, Strawberry, Currants, Gooseberry
Swift moths, larvæ	Strawberry, Raspberry.

D. *Haustellate (Sucking) Insects feeding openly on aerial portions—stems, shoots, foliage, flowers and fruits.*

Capsid Bugs, adults and larvæ	Apple, Currants, Gooseberry.
Aphides	Apple, Cherry, Pear, Currants, Gooseberry.
Aphides, Mealy	Plum.
Woolly Aphis	Apple.
Muscel scale	Apple, Pear, Currants.
Brown scale	Apricot, Peach, Currants, Gooseberry.
Woolly scale	Currants, Vine.

E. *Haustellate Insects feeding on aerial portions but hidden in rolled foliage and flower buds.*

Sucker (Psylla), larvæ	Apple, Pear.
Aphides, Leaf-curling	Apple, Cherry, Peach, Pear, Plum, Currants, Gooseberry.
Aphides, Blister	Currants, Gooseberry.

F. *Haustellate Insects feeding below ground on roots and underground stems.*

Woolly Aphis	Apple.
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FIG. 181.—TORTRIX LARVA DESCENDING BY SILK
THREAD FROM LEAF ROLLED BY LARVA

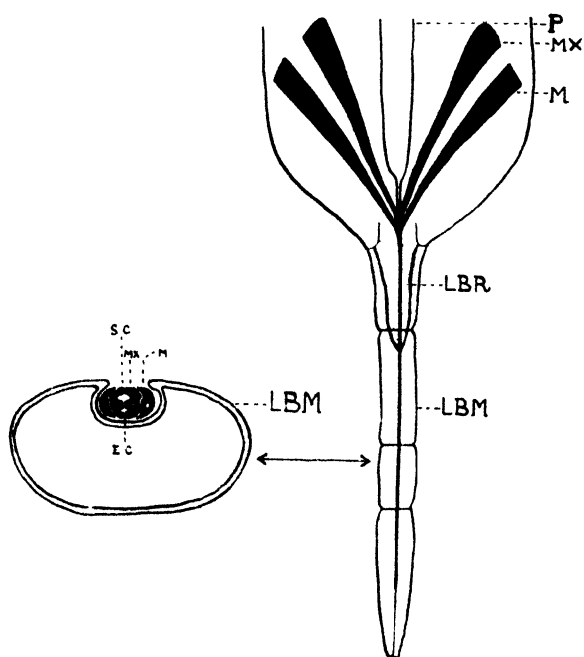


FIG. 182.—DIAGRAM OF SUCKING MOUTHPARTS OF APHIS
(After Imms)



FIG. 183 — PLUM ATTACKED BY LEAF-CURLING APHIS, *Anuraphis padii* L.

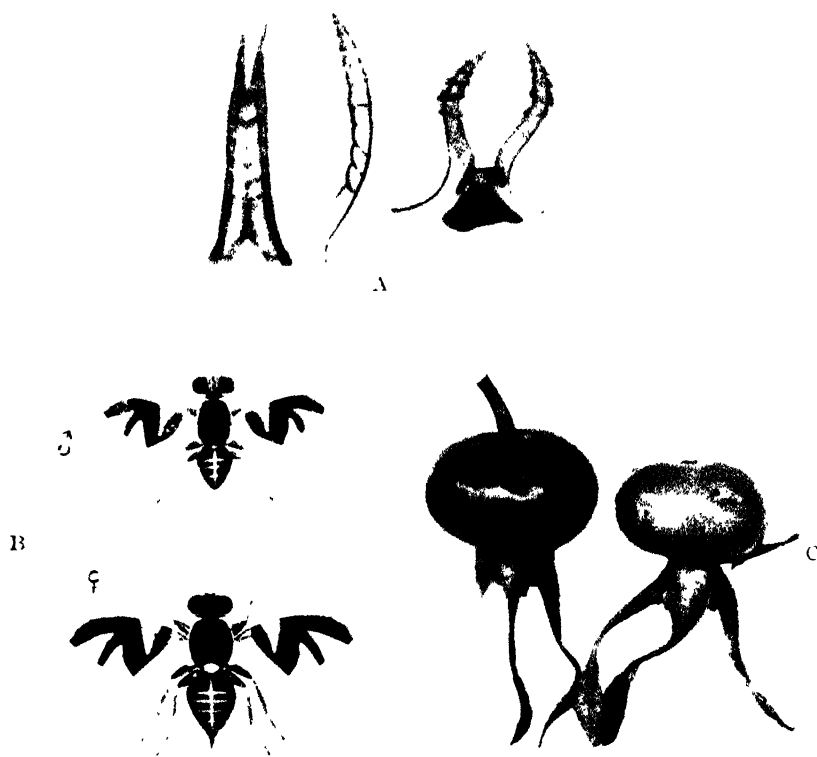


FIG. 184. A. TYPES OF SAWS OF SAWFLIES. (After Morrice.)
 B. APPLE MAGGOT, *Rhagoletis pomonella*. (After Brittain and Good.)
 C. FRUITS OF ROSE PUNCTURED BY ROSE-HIP FLY, *Spilograpta alternata*.

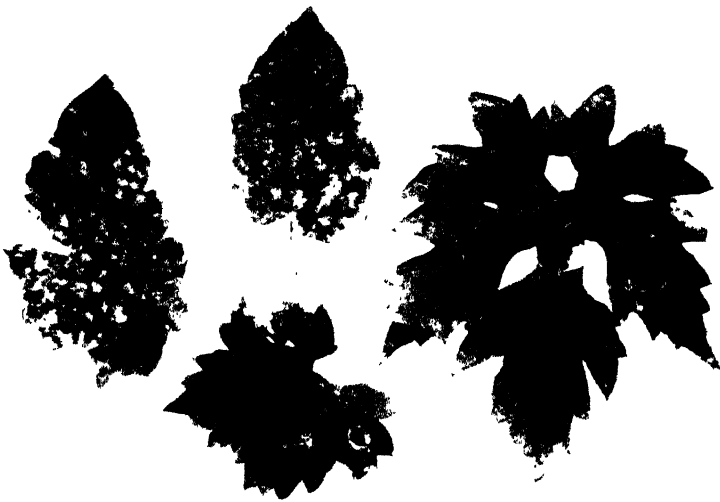


FIG. 185

Above .—Woolly Aphis Tumours eaten by Tits
Below.—Tomato and Vine Leaves infested with White Fly and Soft
 Scale respectively.

[To face p. 545.

THE AWARD OF GARDEN MERIT.—XXIX*

By F. J. CHITTENDEN, F.L.S., V.M.H.

189. *LILIUM REGALE*.*Award of Garden Merit, July 4, 1927.*

In A Naturalist in Western China, E. H. WILSON describes the formation of the deep valleys of the River Min and its tributaries and neighbours on the Szechwan-Tibetan borderland, with the abundant vegetation and wild life that they produce. He tells how the inhabitants of the scattered villages in these valleys wring a precarious living from the cultivation of the inhospitable soil, in which, nevertheless, Nature maintains a large population of plants and animals, and where various Lilies, though local, are numerically abundant. "In the Min Valley," he writes (*loc. cit.*, p. 155), "the charming *Lilium regale* luxuriates in rocky crevices, sun-baked throughout the greater part of the year. It grows 3 to 5 feet tall, and has slender leaves crowded on stems bearing several large funnel-shaped flowers, red-purple without, ivory-white suffused with canary-yellow within, often with the red-purple reflected through, and is deliciously fragrant."

So he wrote in 1913 soon after he had introduced and described the Lily (see Horticulture, 16, 112). Those who wish for a fuller description will find it in WILSON'S Lilies of Eastern Asia (1925), and it is quite likely that the marvellous speed with which *L. regale* made itself at home in western lands was a powerful factor in turning WILSON'S special attention to the genus, leading to the production of that indispensable book.

Long before he died he came to look upon *L. regale* as the plant likely to become the most widely grown and admired of all that were introduced from China through his explorations—the best herbaceous plant of the many good ones we owe to him.

It is true that *L. regale* does not do equally well in all gardens. Indeed, when we, not being satisfied with its growth under our own conditions, asked WILSON where he thought it would do best. He at once said, "In the poorest soil you have." Not so the most experienced lily grower in the British Isles who said in reply to the same question, "You grow potatoes very well in one part of the garden—that is where *L. regale* will do best." It cannot be said that either was right, nor can we now say where it is best. We have seen it magnificent in a moist climate in Western England in heavy clay soil and at least as

* The notes on the first hundred plants to receive the Award of Garden Merit have been collected from our JOURNAL, vols. 47 to 53, and published as a pamphlet, price 1s. For subsequent notes see vol. 54, pp. 218 and 423; 55, pp. 121 and 276; 56, pp. 80 and 245; 57, pp. 65 and 354; 58, pp. 171 and 400; 59, pp. 131, 308, 360, 406, and 449; and 60, p. 89.

good in a medium soil where the climate was hot and dry in summer and 40° below zero was not unknown in winter. It has grown nearly as well in chalky soil and in the sandy soil of the Wisley hillside. It is indeed a plant for all gardens so far as soil is concerned, and as it can be raised from seed as readily as tomatoes it has become common and cheap and known everywhere, while its beauty, added to that of *L. candidum*, has increased the desire to know more of Lilies and to grow more of them. Yet we do not know everything about it even now. One thing seems certain, that it is best growing out of dwarf shrubs, for instance, lavender. Shrubs such as this protect it from its greatest enemy in England—late frost—even if they have no other advantage, and this is most desirable, for it is extremely liable to damage by such frosts. It starts to grow too early and its growths are tender. Once cut, that is the last one sees for that year, and until the next nothing is to be expected. The bulbs themselves are not damaged and will grow again, but the year's flowers are lost. This liability to damage by spring frosts is its only drawback.

Like the great majority of plants raised from seed this varies. There are taller and dwarfer forms which maintain their tall or dwarf character; variations in the form and coloration of the flowers, especially in the amount of yellow in the throat; and variations in other directions. It is wise, therefore, to select the best of every lot of seedlings both for seed saving and for future cultivation.

190. PRUNUS PADUS, KNAPHILL VAR.

Award of Garden Merit, July 4, 1930.

Prunus Padus, the bird cherry, is a native and very hardy tree, growing as a rule in mixed woodland. It may attain to 30 feet in height in time, but it takes many years to reach this size, and is therefore suitable for gardens of moderate size; but it would scarcely come into the first choice of trees for small gardens. In small gardens one's choice must fall upon trees not only suitable in size, but also with more than one season of especial beauty, like the thorn or the Canadian bird cherry. *P. Padus* is chiefly valuable for its flowering, and as the common form flowers in May it has many beautiful trees to compete with and yet holds its own then.

P. Padus is a member of the section of the great genus to which it belongs in which the leaves are deciduous and the flowers arranged in long racemes at the ends of short leafy shoots. The flowers are white and like those of a rather small-flowered cherry, while the fruits, generally shiny black, are also like a tiny cherry but acid in flavour, in spite of which birds devour them readily. Many varieties of this tree have been described, and among them the Knaphill variety (var. *Watereri*) is outstanding on account of the length of its racemes, which are up to 8 inches long. The leaves of this variety are also distinct in the conspicuous tufts of hair in the axils of the veins on the underside. Either this or the variety *plena* with semi-double

flowers should be chosen for the more select parts of the garden. An interesting variety from Manchuria called *commutata* is also worth planting, for its flowers open three weeks earlier than those of the type and are at their best in April. This variety has unfortunately sometimes been called *P. Grayana*, a name belonging to another (Japanese) species. Other variations are shown in the fruits, which may be red, yellowish-white, or yellowish-green, and in the size of the foliage and so on, as might be expected from the wide distribution of the species throughout northern Europe and Asia as far east as China.

191. SAXIFRAGA \times APICULATA.

Award of Garden Merit, June 28, 1932.

A comparatively small number of rock plants have so far received the Award of Garden Merit, perhaps because so many have special requirements if really good results are to be had from them. *Saxifraga* \times *apiculata* is, however, among the dependable plants, easy to obtain, relatively easy to grow, and likely to give pleasure year after year. A well-drained site on the rock garden, so arranged that water does not stand at any time around its "collar," will suit it, and there it will spread into wide masses of small rosettes of bright, pale green, narrow, sharp-pointed leaves from which arise in February and March numbers of primrose-yellow flowers on pinkish stems 3 or 4 inches long, each stem bearing a rather loose corymb of four to six yellow flowers, each about $\frac{1}{2}$ inch in diameter.

S. \times apiculata was one of the earliest of the hybrid Saxifrages of the Kabschia group to be raised (it was described in 1894) and is still among the best. There is a good figure in the Bot. Mag., t. 8048. The parents were *S. marginata* var. *Rocheliana* and *S. sancta*. A white variety is also known (*S. \times apiculata alba*) with the same parentage. The Saxifrages known in some catalogues as *S. luteo-purpurea*, *S. Alberti*, *S. scardica*, *S. Friderici Augusti* and *S. \times Malyi* are very similar to this if not identical, although some of these names belong properly to other plants.

GARDEN NOTES.

Peaches on East Walls.—Six years ago thirteen varieties of Peaches were planted on an eastern section of the garden wall with the idea of prolonging the season. So well have the trees done that to-day it is one of our best Peach sections, and the wall, 15 feet high, is practically covered from top to bottom. The varieties in their order of ripening are 'Early Alfred' (first fruit picked, July 27), 'Alexandra Noblesse,' 'Stirling Castle,' 'Peregrine,' 'Early Gros Mignonne,' 'Prince of Wales,' 'Princess of Wales,' 'Sea Eagle,' 'Marquis of Downshire,' 'Nectarine Peach,' 'Thomas Rivers' (very large), 'Lady Palmerston,' 'Golden Eagle' (still picking, October 1935).

'Lady Palmerston' was the only variety that did not reach the best quality, and I think that was caused by the terrible weather conditions experienced just at the finishing stage. The trees were all lifted and replanted the first three seasons, adding plenty of old mortar rubble and a very heavy local loam. No manure of any description was given until this year after the final thinning, and the fruits were exposed with the aid of thin laths; the trees were then mulched with partially decayed farmyard manure thoroughly well watered in. The borders are watered weekly with river water, and in winter if no rain falls for several weeks. The natural soil is medium loam over green sandstone, and the ground in front is occupied by various summer-flowering plants, at present Phlox. Pests are not nearly so troublesome as on the south walls. One season only was the Peach Blister very bad. Since then we spray the first week in February, and again in March before the buds burst, with a fungicide containing copper sulphate: the last two seasons we have not seen one curled leaf, and no other spray has been used on these trees.

All the varieties set very heavy crops, and the thinning was done in three operations, finally leaving them about 1 foot apart. No protection was given at any time. The wood is now ripening well and is thickly set with buds for another crop.

The object of this note is to show that these luscious fruits may be grown on aspects not generally considered suitable.—*F. Streeter, Petworth Park Gardens, Sussex.*

Gentiana ornata.—This Himalayan Gentian was introduced to cultivation by Mr. THOMAS HAY, and has proved to be one of the most beautiful of the genus. It is of the *Frigida* section, and grows more compactly than any of its fellows. The blooms vary in colour from pale blue to medium blue. They have a much shorter corolla than most of the section, and the edges are much recurved, so that in cold and sunless weather it is not so apt to close as are some of the others.

One of its merits is the freedom with which it flowers. A bed was planted at Bodnant this spring of divided plants and seedlings—the divisions being the smallest possible units. The plants in this bed commenced flowering in August, and in the last week of October, on a sunny day, no fewer than 2,400 flowers were counted in a space approximately 5 yards by 2 yards. One plant had no fewer than 81 flowers and buds on it.

The plant is not difficult in cultivation, although not as easy as *Gentiana sino-ornata* or *G. × Macaulayi*.

A gentle slope facing the north appears to suit it better than a slope facing south, while it dislikes shade or drip.

Mr. Hay is much to be congratulated on so noteworthy an addition to our gardens.—*Lord Aberconway, Bodnant.*

BOOK REVIEWS.

"Lilies: Their Culture and Management." By H. Drysdale Woodcock, K.C., and J. Coutts, V.M.H. 8vo. xv + 242 pp. (Country Life, 1935.) 15s. net.

Conceived in an ambitious, all-embracing spirit to which the limitations of space must have been a deterrent, the book fulfils its expressed object, which is the production of a work that may prove of some practical value to all Lily gardeners who are also unscientific amateurs. Their numbers are undoubtedly greater than they were a few years ago, but in relation to the gardening fraternity generally, are merely fractional; so that the book can hardly enjoy a wide circle of readers. The limitations of space, no doubt, explain the absence of more than a word or two about Dr. ALEXANDER WALLACE's work on Lilies, of any reference to the part played in the cultivation of the genus by G. F. WILSON of Wisley, or of the interest evoked in Lilies through the efforts of WILLIAM ROBINSON, who, by his articles in *The Garden* and the fine series of chromolithographic plates he prepared, regardless of cost, opened the eyes of many gardeners to the possibilities of the genus, and especially the Californian section of it.

For keen Lily growers the list of Lilies of the world is the *clow* of the work. This occupies more than half the book, and is hampered by the inclusion of every hybrid of which the compiler of the list has been able to find a record; many of these are of an ephemeral character, and the space might profitably have been devoted to more serious purpose. The list, which is a definite attempt at an up-to-date enumeration of Lilies, includes sundry revisions of nomenclature which remain to be accepted or rejected by informed opinion and need not necessarily be regarded as final.

The chapters on climate and soils, the place of Lilies in a garden, the planting of the bulbs and on the propagation of Lilies, are obviously the outcome of first-hand knowledge, and if some of the author's conclusions as to cultivation prove unacceptable to other practitioners, that, perhaps, is only to be expected. The view, for instance, that leaf mould is the best of food for Lilies (p. 26), depends on circumstances and on the leaf mould. That which is found in a few old woods, and is as old as the woods themselves, is ideal for the purpose, but this is beyond the reach of too many gardeners. The home-made leaf mould of the average garden teems with the spores of *Botrytis* and other fungi, and is usually alive with destructive insect life; its complete sterilization can only be attempted by those who have the requisite plant. There is reason in the tendency of the day towards the use of compressed peat, for it is sterile and is presented to gardeners in most convenient form; apart from its cost, the sole objection to it is that it is so finely divided that its absorption is inconveniently rapid. In sandy soils, two years may see the disappearance of crushed peat that is used in the customary proportion of one to one with the soil.

The advice (p. 32) to plant bulbs at least two feet from the nearest shrub should be qualified, for there are many instances where some of the European Lilies, like *L. Marlagon* and *L. Szovitsianum*, not only grow but flourish in the heart of the roots of hedge plants like Yew, Thuja and the like, where the competition for moisture must be keen.

A healthy leaf growth is no doubt essential to the development of Lily bulbs, but the suggestion (p. 41) that it is ruinous to cut the blooms of Lilies if too much foliage is involved, is not borne out in practice. Many a Lily stem in various stages of development is accidentally trodden on and spoiled, broken off by wind or falling branches, or eaten down by slugs or rabbits in the early stages of growth without any harm to the bulb. In fact, such incidents usually result in an access of vigour in the bulb. It is a point on which theory and practice diverge and needs elucidation.

The advice to place bulbs on their sides (p. 39) to minimize the effects of wet winters holds good only in the case of bulbs without roots. When transplanted, horizontally placed rooted bulbs quickly pull themselves into the upright position.

The oft-repeated statement (p. 98) that *L. candidum* seldom produces seeds spontaneously, needs qualification, for the point turns on the heat of the season. In 1911, 1921, 1933, 1934, and again this year, the seeding of this Lily was recorded in many gardens where no sign of a capsule is found in a normal summer.

In a critical sense the list of Lilies of the world is more vulnerable than the chapters referred to above, and apart from debatable points in nomenclature, is not remarkable for the fine sense of observation of the growing plant that distinguishes those chapters. Minor points of cumulative value escape notice, as in the case of the reticulation of the young leaves of the old *L. cordifolium*, now *L. cordatum* (p. 111), a character that, jointly with the rufous colouring, is shared with *L. giganteum* var. *yunnanense*, but not with the Himalayan type.

A result of the seminal propagation of Farrer's Lily, which, until recently, has generally been regarded as a variety of *L. Duchartrei*, is not to confirm Dr. TURRILL's publication of it in 1919 as a species.

WILSON's statement that *L. formosanum* will bloom in six months from the sowing of the seeds (p. 125) is confirmed by CRAIG, an American observer.

Some peculiar local condition is probably responsible for the observation (p. 207) that *L. Willmottiae* is apt to flower itself to death, for, in congenial conditions, floriferous individual examples of the species have persisted to a remarkable degree since it was introduced by WILSON. The advice to plant the bulbs of this Lily from 8 to 12 inches deep should not be followed too literally, and a maximum depth of 8 inches is ample, even in sandy ground. It is to be hoped that the suggestion that this species may have to be reduced to *L. chinense* may prove groundless.

The ascription of specific character to *Notholirion campanulatum* (p. 209) may not stand the test of seminal propagation, and the doubt can easily be resolved.

Although such points are matters of taste, *L. carniolicum*, as grown in this country, can hardly be considered a beautiful Lily (p. 104); the colour is sometimes a dull shade of red that, seen in the mass on its native hillsides, is effective enough; but in individual plants it is unattractive, and when the Lily is raised from seeds, the petals are more often a dirty brick colour than red.

In the list of accepted varieties of *L. elegans* (p. 123) there is no mention of the old variety, *Wilsoni*, which is possibly the best of the group.

Limitations of space again are, presumably, responsible for the brief chapter on pests and diseases of Lilies in cultivation. The latter include the ever-present menace of Botrytis, as well as a condition that simulates Botrytis but is not apparently related to it, and virus diseases. Until quite recently the last were confined to imported bulbs, but as with Lilies in the United States, are now found in cultivated stocks of home-grown bulbs. The control of Mosaic, as it is called, is quite well understood, and if measures are not taken to stamp it out of home-grown stocks, the Ministry of Agriculture may find it necessary to deal with the problem.

The index to the book is scrappy, and such misprints as there are will doubtless receive attention in future editions, of which we may hope there may be many.

The illustrations with which the work is so lavishly furnished have been collected from diverse sources and are of unequal merit. It ought not to have been impossible to find photographs of more typical examples of *L. Davidi* and *L. tenuifolium* (Figs. 108 and 109), *L. Kelloggii* (Fig. 80), and *L. × Maxuill* (Fig. 65), for instance, than those that have been used. The fine flowering head of *L. Sargentiae*, illustrated on p. 178, is singularly deficient in the bulbil character for which this species is remarkable. The book is the offspring of enthusiasm allied to experience. It fills a void and should prove of material use to those for whom it has been written.

A. GROVE.

"Plant Physiology." By Merion Thomas, M.A. 8vo. 494 pp. (Churchill, London, 1935.) 15s.

Before the war there were very few English text-books in this country dealing with Plant Physiology. The rapid growth of the subject resulting from the investigation of many physiological problems, together with the research work of academic scholars, has now resulted in the appearance of several English texts. Here is another one, and it is welcomed because it deals with the subject from the university teaching point of view. The book is primarily one for serious students. It is more concerned with physico-chemical than with economic aspects.

The early chapters deal with the living units of the plant and the properties of protoplasm. A very clear account of the enzymes is given in short space by the author. The second portion deals with the relationship of the manufactured food products and their distribution through the plant, and with the water movements inside the tissues. The third part of the book concerned with metabolism and a detailed consideration of photosynthesis and respiration, reflects the opinions of the Cambridge physiological research workers. The last

section is concerned with growth and movement and forms a neat review of the modern Dutch work dealing with growth-promoting substances.

The first Appendix deals with organic compounds; the second with physical chemistry, and the third with bibliography. The book has a good subject index, and the author index has been prepared by rigorous selection; this unfortunately leaves out of consideration many valuable papers, some of which are mentioned; but on the other hand it does not embarrass the student with a multitude of references.

Throughout, the text reads simply and the needs of the student have obviously been thoroughly considered, as shown by cross references, by the clear diagrams of apparatus, and by charts showing the results of experimental work.

There are other volumes in this series dealing with recent advances in botany, and the author has deliberately omitted from his consideration certain sections of plant physiology. As a text-book dealing with the subject from the biochemical point of view, we can thoroughly recommend the book to all students and those preparing students for degree courses.

Commencing the second part there appears to be an error where the text reads: "There are several reasons why a *flag* cannot grow without water." (p. 48).

M. A. H. TINCKER.

"Chronica Botanica." Edited by Fr. Verdoorn. 8vo. 378 pp. (Leiden, Holland, 1935.)

This is the first issue of "an annual record of pure and applied Botany," and very well it is done.

It is for the most part in English, and it is introduced by an article by Dr. Merrill on International Co-operation among Botanists.

It contains an Almanack giving dates of birth of prominent botanists living and dead, important botanical meetings and conferences, and important horticultural meetings and conferences. This is followed by a preliminary account with portraits of the International Botanical Congress in Amsterdam, 1935, and accounts of important congresses held in 1934.

A review of important matters concerning all branches of plant science during 1934 occupies pp 77 to 333 arranged alphabetically, and here are to be found accounts of the activities of various societies like our own, and at the end are given lists of new periodicals with notes, and of new addresses of botanists forming a most useful supplement to the International Address-Book of Botanists.

The book forms an indispensable reference book for all in any way concerned with botanical work. It is published in April.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

REPORT OF THE COUNCIL

FOR THE ONE HUNDRED AND THIRTY-FIRST ANNUAL MEETING OF THE SOCIETY,
TO BE HELD IN THE LECTURE ROOM OF THE NEW HALL, GREYCOAT STREET,
WESTMINSTER, AT 3 P.M. ON TUESDAY, FEBRUARY 19, 1935.

The Year 1934.—General increase in interest taken in horticulture has continued, and it is gratifying to report a further large addition to the numbers of Fellows and Associates. The Society attained in 1934 a total Fellowship of nearly 30,000, made up as follows:

LOSS BY DEATH IN 1934.			ELECTIONS IN 1934.		
Honorary Fellows	..	5	Associates of Honour	...	9
Associates of Honour	...	3	Life Fellows	...	15
Life Fellows	...	13	4 Guinea Fellows	...	20
4 Guinea Fellows	...	3	2 " "	...	1,260
2 " "	...	232	1 " "	...	2,137
1 " "	...	191	Associates	...	99
Associates	...	3	Affiliated Societies	...	57
		<hr/> 450			<hr/> 3,597
LOSS BY RESIGNATION.			Deaths and Resignations		
4 Guinea Fellows	...	7		...	2,114
2 " "	...	551			<hr/>
1 " "	...	1,002	NET INCREASE	...	1,483
Associates	...	60			<hr/>
Affiliated Societies	...	44			
		<hr/> 1,664	Total on November 7, 1933	28,397	
			Total on November 8, 1934	29,880	

Obituary.—The Society has to deplore the loss, during the past year, of many noted horticulturists. Among them are: Sir William Lawrence, Bt., a Member of Council, a past Treasurer of the Society, and a holder of the Victoria Medal of Honour; Mr. William Cuthbertson, a Vice-President of the Society, a former Member of Council, and a holder of the Victoria Medal of Honour; Mr. Reginald Cory, a former Member of Council and a benefactor in many ways to the Society by his generous gifts; and Miss Ellen Willmott, a great amateur gardener, who did much to introduce and raise new plants, and who was one of the original recipients of the Victoria Medal of Honour. Besides these there must be noted Lord Riddell, a benefactor to the Society and a keen amateur grower of vegetables; Sir James Knott, a Vice-President of the Society and founder of Scholarships for young gardeners; Dr. Hiatt C. Baker, an enthusiastic amateur gardener; Mr. R. Barclay Fox, whose garden at Penjerrick was so well known; Mr. Arthur G. Soames of Sheffield Park, a garden noted for its wonderful autumn colours; Mr. L. B. Stewart, the Curator of the Edinburgh Royal Botanic Gardens; Mr. A. Bedford and Mr. A. E. Vasey, Associates of Honour and members of the Society's Committees; Mr. W. Irving and Mr. R. C. Pulling, members of the Society's Committees; Mr. B. H. Buxton, an eminent scientist, who worked at Wisley; and Dr. N. L. Britton, of the New York Botanic Garden, and Mr. C. Herman Senn, Honorary Fellows of the Society.

Fortnightly Meetings and Shows.—The Fortnightly Meetings and Shows at the Halls have been well attended throughout the year, and those who have staged groups are to be congratulated on the very high standard which has been maintained.

The Daffodil Show.—The Daffodil Show, which was held on Tuesday and Wednesday, April 10 and 11, did not attract so many entries as usual on account of the difficult season, but the exhibits were of good quality. The Daffodil Show in 1935 will be held on Tuesday and Wednesday, April 16 and 17, and, in connexion with the Show, there will be a Daffodil Conference which will include papers on the following subjects: "British Daffodils—Past and Present," "Narcissus Species," "Daffodil Trials," "Preparation for Forcing," "Breeding," "Commercial Cultivation," and "Diseases and Pests." An Excursion to Spalding will be arranged in connexion with the Conference.

Early Market Produce Show.—The third of a series of Shows of Early Market Produce (flowers and vegetables) was staged in the Old Hall on Tuesday and Wednesday, April 17 and 18. The Show was opened by the Rt. Hon. Sir Godfrey Collins, K.B.E., Secretary of State for Scotland, in the absence of the President of the Board of Trade through illness, and generally showed a marked improvement on the previous Shows. A similar Show will be held in 1935, on Wednesday and Thursday, April 24 and 25, and a discussion on "Irrigation and Horticultural Crops" is being arranged.

The Chelsea Show.—The Chelsea Show was held on Wednesday, Thursday and Friday, May 30, 31, and June 1. Their Majesties the King and Queen again honoured the Society by a gracious visit. The Society was fortunate in being favoured with very good weather, and there was a largely increased attendance at the Show. This Show will be held in 1935 on Wednesday, Thursday and Friday, May 22, 23, and 24, and to celebrate the twenty-fifth anniversary of His Majesty's accession to the throne a silver trophy, to be known as "The Jubilee Trophy," will be offered for award for the best exhibit staged by an amateur. The Jubilee Trophy will be accompanied by £20 for the exhibitor's gardener. The exhibitor will also receive the Cain Challenge Cup.

The Amateurs' Flower Show.—The tenth Amateurs' Flower Show was held on Tuesday, June 19. The Show was better patronized by exhibitors than in previous years, and the excellence of the exhibits was encouraging. In 1935 the Show will be held on Tuesday, June 25.

British-grown Bulb Show.—At the Fortnightly Meeting on Tuesday and Wednesday, August 28 and 29, the Fellows had an opportunity of seeing an exhibition of British-grown bulbs. These exhibitions have successfully demonstrated the progress of the British-grown bulb industry.

The Autumn Show.—The largest Autumn Show the Society has ever staged was held at the Crystal Palace on Wednesday, Thursday, Friday and Saturday, September 19, 20, 21, and 22. Almost the whole of the floor space of the Crystal Palace was filled to overflowing with very fine exhibits and, in connexion with the Fruit Conference, an imposing display of fruit was on view, the equal of which perhaps has never before been brought together by the Society. The Society is grateful to Sir Henry Buckland, the Manager of the Crystal Palace, for his readiness in assisting the Society in every possible way. The National Hall, Olympia, has been secured in 1935 for the Autumn Show on Wednesday, Thursday and Friday, September 25, 26, and 27.

Apple and Pear Conference.—The Conference on Apples and Pears held during the Great Autumn Show was well attended, and the Council is grateful to the authors of papers and those who attended and took part in the discussions. The proceedings of the Conference will appear early in 1935, and will form a useful book for all those interested in the cultivation of Apples and Pears, as the information gathered together covers practically every phase of the growing of these fruits. Another important part of the Conference was the work of the Committee on the Nomenclature of Apples; very large exhibits of apples from all parts of the United Kingdom and Ireland, as well as interesting collections from abroad, were staged, and the Committee was able thereby to correct some of the nomenclature of past years.

To supplement this work a Conference on Cherries and Soft Fruit has been arranged for July 16 and 17, 1935, on which occasion the National Farmers'

Union (Kent Branch) will stage its Cherry and Soft Fruit Show in the Society's Hall. At this meeting there will be discussed the cultivation and varieties of cherries, strawberries, gooseberries, raspberries and blackberries for the market and for private gardens, as well as questions of the manuring of soft fruits, their diseases, and the varieties suitable for canning and for domestic purposes.

The Lily Group.—During the year the Lily Group has held four successful meetings, and the reports of the discussions which took place have been published in the Lily Year-book for 1934. On July 7 a number of members of the Lily Group spent an afternoon at Wisley inspecting the many species of Lilies established there.

Wisley : The Garden.—The long-continued dry weather experienced at Wisley during the past summer proved very trying for some of the plants, especially for those that required moist conditions both at their roots and in the atmosphere, such as *Meconopsis*, *Primulas* and *Rhododendrons*. At the same time many of the flowering shrubs have flowered and fruited very profusely. Both the species of *Berberis* and their hybrids have been remarkably effective, as have also *Malus* and other genera usually grown for the ornamental effect of their fruits. The rainfall registered at Wisley up to the end of October was 15.60 inches, the normal amount for the same period being 19.44 inches.

Award of Garden Merit : A portion of the garden has now been set aside for plants which have received the Award of Garden Merit. Here visitors may gain information about the most generally useful garden plants, such as should form the nucleus of any good collection.

The new Herbaceous Borders, the planting of which was finished in April 1934, have attracted much attention from visitors, who found this part of the garden full of colour from June to September.

The greenhouse devoted to the cultivation of half-hardy plants is now fast becoming furnished and the collection is gradually being increased.

Alterations : The borders on either side of the wide stretch of lawn intersecting the general Trial Ground, near the entrance gates, are being lengthened in order to accommodate the whole collection of Dahlias.

The collection of Irises, which forms a permanent trial at Wisley, has been removed to the ground south of the path leading from the greenhouses to the Wild Garden.

A wide grass walk has been formed from the Fruit Exhibition House in a westerly direction to the boundary of the garden south of the Alpine House. This walk will be bordered by a double avenue of Japanese Cherries.

Flower and Vegetable Trials : The Floral Trials carried out during 1934 comprised those of Clarkias, Larkspurs, Tropaeolums and Oenotheras. Owing to the drought experienced after the planting of the Tropaeolums this trial was not a success, and it will therefore be repeated in 1935.

The trials of Vegetables consisted of Early Potatoes, Brussels Sprouts and Celeriac.

A test of grease-banding and greases has been made during the year, and also a trial of hand-dusting machines for use in private gardens.

Of the several miscellaneous subjects selected for trial at Wisley by the Floral Committee, the following have been grown : *Primula sinensis* 'Dazzler', *Cineraria* 'Rainbow', *Primula malacoides* 'Carmine Pink', *Salvia farinacea* 'Blue Bedder', and *Aubretia* 'Barker's Double.' These were considered by the judges to be of sufficient merit for recommendation for awards.

Visitors : More than 28,000 visitors have entered the garden during 1934, without counting visits from the members of a considerable number of horticultural associations affiliated to this Society.

Distribution of surplus plants and seeds : The number of parcels of surplus plants and seeds despatched to Fellows during the year amounted to 13,383—a considerable increase on the applications received in 1933.

Commercial Fruit Trials : There has been no material alteration in the area of the land, 38 acres in all, occupied at Wisley by the trials of varieties of all kinds of hardy fruits. These trials, conducted under a Joint Committee of the Society and of the Ministry of Agriculture and Fisheries, cater primarily for the needs of commercial fruit-growers all over the country, and for the Fruit Canning Industry ; but amateur gardeners are finding them of increasing interest

and value. The Standard Collection of fruit maintained for the purpose of comparison and synonymy now includes nearly 1,500 varieties. Crops of all kinds of fruits have been remarkably heavy in 1934 and the trials have attracted a greatly increased number of visitors. New varieties have been added to the trials, and further material has been selected and propagated for distribution to the ten sub-stations in different parts of the country.

The Wisley Laboratories.—The experiments on Lilies suggested by the Lily Committee have been carried out during the year, particular attention being paid to the influence of drainage conditions and soil aeration upon the growth of Lilies in the open, in pots, under glass, and under other experimental conditions. Investigations of methods of Lily propagation from scales are also being undertaken.

Other experimental work concerns the influence of the period of light on growth. A report on the influence of soil factors on the growth of certain vegetables has been published.

The investigation of the Stem Eelworm in its relation to Phlox and other Polemoniaceae has been continued, and the effect of artificial fertilizers on the resistance of Phlox to Eelworm has been studied further.

Investigations on Delphinium Mildew and its control have progressed satisfactorily and a report is being prepared for publication. Results of investigations of the Ink disease of *Iris reticulata* (*Mystrosporium adustum*) will also be published in due course.

The Mycologist is continuing an investigation upon the conditions bearing upon the occurrence of Antirrhinum Rust in this country.

Another year's work on varietal susceptibility to the Stripe disease of Narcissi, believed to be caused by a virus, has been carried out, together with observations on the influence of various chemical treatments of the bulbs during the hot water treatment against Eelworm.

The work undertaken in connexion with the advice given by the Society to Fellows has markedly increased during the year.

Demonstrations have been given to inspectors of the Ministry of Agriculture on the detection of Rhododendron White Fly on plants for export.

Again during this year all demands for the White Fly Parasite have been met, and an increased number of parcels has been despatched. The supply of the White Fly Parasite for distribution from Wisley is necessarily limited, and to maintain it special measures have to be taken entailing considerable care and expense. The Council has therefore decided that next season, from May onwards, a charge of 5s. for the supply for a large greenhouse, and 2s. 6d. for the supply for a small one, will be made.

School of Horticulture.—Sixteen student gardeners are attending the courses of lectures. Of the candidates gaining the National Diploma in Horticulture this year two were Wisley student gardeners.

Demonstrations of Garden Operations.—The demonstrations on practical gardening subjects have proved of interest, and all were well attended and appreciated by Fellows. The demonstrations to be carried out in the Gardens during 1935 are:

March 13 and 14: "Seed Sowing, Indoors and Outdoors."

March 20 and 21: "Rose Pruning."

April 10 and 11: "Spring Spraying of Fruit Trees and Pruning of Shrubs."

July 24 and 25: "Summer Pruning of Fruit Trees and of Shrubs."

November 6 and 7: "Planting of Fruit Trees and of Roses."

December 4 and 5: "Pruning of Fruit Trees."

The Public and the Gardens.—This year, for the first time, the Gardens have been open to the public during certain hours on the payment of 2s. 6d. per head, or by special arrangements in the case of large parties.

Lectures.—The Council records its grateful thanks to the lecturers who have assisted at the Fortnightly Meetings, and especially Dr. W. F. Bewley, who delivered the Masters Memorial Lectures on "Health and Disease in Plants." Sir William Wright Smith, the Director of the Royal Botanic Gardens, Edinburgh, will deliver the Masters Lectures in 1935, and will speak on "Some Problems connected with the Classification of Plants."

Deputations.—The Society sent deputations to the Cornwall Spring Flower Show held at Truro on April 24 and 25, and to the Harrogate (Jubilee Year)

Flower Show held on September 5, 6, and 7; the Council desire to express their thanks for the hospitality accorded to the deputations on these occasions.

Cups.—The Society presented a Cup for award for the best exhibit of an Old World Garden at the Canadian National Exhibition held in Toronto on August 24 to September 8, 1934; a Cup for the best exhibit at the Horticultural Exhibition held on the occasion of the Victorian Centenary in Australia; and a Cup to the New York Horticultural Society for the most meritorious exhibit staged by an amateur at its Twenty-first Annual International Flower Show.

The Society's Publications.—Perhaps the most important work under this heading that the Society has undertaken this year is the issue of its JOURNAL in monthly parts. The new form of the JOURNAL commenced in September, and while it is not intended that the valuable qualities of the old JOURNAL should be superseded, it is believed that this monthly publication will keep Fellows more closely in touch with the Society. Records of its Committees will be more readily available; information of coming events will be more quickly brought to the notice of the Fellows; and the Society's activities at Wisley will be more frequently recorded.

As forecast last year, the preparation of the JOURNAL INDEX is in hand, and it will be published at the end of 1935 or the beginning of 1936.

Among other publications that have appeared are the "Lily Year-book for 1934," which contains important papers on the cultivation of Lilies, and the reports of the Lily Group Meetings; the "Daffodil Year-book for 1934"; and a leaflet on "Antirrhinum Rust," which has been widely circulated to Fellows, affiliated societies, and the public, in an effort to help to control the spread of this disease of a popular plant.

The Lindley Library.—During the past twelve months the Library has been visited by some 1,500 persons. Two hundred and thirty books and pamphlets have been added during the year to the Library, amongst which the following may be mentioned: Boccone, P., "Musco di piante rare," 1697; Bretschneider, E., "Botanicon Sinicum," 3 vols., 1882-95; Breyn, J., "Prodromi fasciculi rariorum plantarum primus et secundus," 1739; Browne, P., "Civil and Natural History of Jamaica," 1789; Dodart, D., and others, "Mémoires pour servir à l'histoire des plantes," 2 vols., 1675-81, a very fine copy from the Imperial Hermitage Library of the Czars of Russia with 319 plates above the usual 39 plates issued with text; Fiori, A., "Nuova flora analitica d'Italia," (2 vols.), 1923-29; "Herbolario volgare," 1536; Hoffmannsegg, J. C. von, and Link, H. F., "Flore Portugaise" (2 vols.), 1809-20; Javorka, S., and Czapody, V., "Iconographia florum Hungaricarum," 1929-34; Kerner, J. S., "Abbildung aller oekonomischen Pflanzen" (8 vols.), 1786-96; Kotschy, T., "Die Eichen Europa's und das Orients," 1862; Sloane, Sir Hans, "Voyage to . . . Jamaica" (2 vols.), 1707-25; Trew, C. J., and Vogel, B. C., "Plantae rariores," Dec 3 (in 1 vol.), 1764-95; Verzascha, Bernard, "New Krauterbuch," 1678; Wold, T., "Monographie der Gattung Potentilla," 1908.

Cory Bequest.—The whole of the unique and very valuable collection of books dealing with botany and horticulture formed by the late Mr. Reginald Cory has been bequeathed to the Lindley Library. An account of this munificent and welcome gift will be published in the JOURNAL as soon as possible after the books have been incorporated in the Library.

Society's Examinations.—The Horticultural Examinations held annually by the Society were well attended; there was an increase in the number of candidates this year. In 1934 three candidates in Section 1 (General Horticulture), three candidates in Section 2 (Hardy Fruit Growing), one candidate in Section 5 (Landscape Gardening), and two candidates in Section 6 (Gardening in Public Parks) were awarded the National Diploma in Horticulture. At the Preliminary Examination 24 candidates were successful, and they will be eligible for the Final Examination after their six years of practical gardening has been completed.

The standard and results of the General Teachers' Examinations were very satisfactory. The British Floral Art Diploma, intended primarily for florists and florists' assistants, has been conferred on eight candidates during the year.

The Victoria Medal of Honour.—The Victoria Medal of Honour has been awarded to Lord Aberconway, C.B.E., President of the Society, for his work in

the introduction and growing of rare and uncommon plants ; to Mr. Wm. Hales, A.L.S., a member of the Society's Scientific Committee and Board of Examiners, for his work in connexion with the Chelsea Physic Garden ; to Sir Arthur Hill, K.C.M.G., Sc.D., F.R.S., formerly a member of the Council of the Society, for his work as Director of the Royal Botanic Gardens, Kew ; to Mr. George Monro, C.B.E., a retiring member of the Council of the Society, for his work in commercial horticulture ; and to Mr. Charles R. Scrace-Dickins, a keen amateur gardener and a grower of difficult plants, who has been associated with the Society's activities during a long period of years.

The Associateship of Honour.—The Associateship of Honour has been conferred on Mr. F. S. Barron, Manager of the Seed Department of Messrs. R. H. Bath, Ltd. ; Mr. S. W. McLeod Braggins, Superintendent of the Gardens of Mr. Cecil Hanbury at La Mortola, Ventimiglia, Italy ; Miss Mary E. Burton, late Head Gardener to the Private Mental Institution, New Saughtonhall, Polton, Midlothian, and late President of the Scottish Horticultural Society ; Mr. W. B. Gingell, late Park Superintendent of the London County Council (Dulwich Park) ; Mr. A. T. Harrison, Head Gardener at the Training Centre of the National Committee for the Training of Teachers, Jordanhill, Glasgow ; Mr. E. R. Janes, of Messrs. Sutton & Sons, Ltd. ; Mr. G. Nobbs, Head Gardener at Osborne House, Isle of Wight ; Mr. C. P. Raffill, Assistant Curator at the Royal Botanic Gardens, Kew ; and Mr. A. E. Usher, Head Gardener to Sir Randolph Baker, Bt., at Ranston House, Blandford, Dorset.

The Lawrence Medal.—The Lawrence Medal for the best exhibit staged at the Society's Shows during the year has been awarded to Mr. F. A. Secrett for his exhibit of Vegetables and Flowers in Market Packages on April 17, 1934.

The Holford Medal.—The Holford Medal for the best exhibit of plants and/or flowers (fruit and vegetables excluded) shown by an amateur during the year in the Halls of the Society has been awarded to Mr. J. Pierpont Morgan for his exhibit of Begonias on November 6, 1934.

The Veitch Memorial Medals. Awards have been made as follows: A Gold Medal to Mr. E. A. Bunyard for his contributions to Pomology ; a Gold Medal to Captain F. Kingdon Ward, V.M.H., for his explorations and introduction of new plants ; and a Silver Medal and £25 to Dr. George Taylor for his work on the "Genus *Meconopsis*."

The Reginald Cory Cup.—The Reginald Cory Cup for the raiser of the best new hardy plant of garden origin shown to the Society in the course of the year has been awarded to the Director of the Royal Botanic Gardens, Kew, for *Rhododendron impeanum* (*impeditum* × *Hanceanum*), shown on May 8, 1934.

The Loder Rhododendron Cup.—The Loder Rhododendron Cup has been awarded to the Rt. Hon. Sir Herbert Maxwell, Bt., P.C., K.T., F.R.S., D.C.L., LL.D., V.M.H., who by his writings and paintings has done so much to foster interest in the Genus *Rhododendron*.

The George Moore Medal.—The George Moore Medal has been awarded to Mr. Lionel de Rothschild for *Cypripedium* 'Beersheba,' shown on January 9, 1934, considered to be the best new *Cypripedium* shown to the Society in the course of the year.

The Sander Medal.—The Sander Medal has been awarded to Messrs. H. G. Alexander, Ltd., for *Cymbidium* 'Cassandra' var. 'Betty,' shown on March 6, 1934, which was considered to be the best new greenhouse plant shown to the Society in the course of the year.

The Williams Memorial Medals.—The Williams Memorial Medals for the best groups of plants and/or cut blooms of one genus (fruit and vegetables excepted) which show excellence in cultivation exhibited during the year have been awarded to Messrs. Armstrong and Brown for their exhibit of *Cypripediums* staged on January 9, 1934, and to Mr. J. Pierpont Morgan for his exhibit of Begonias staged on November 6, 1934.

The Sherwood Cup.—The Sherwood Cup for the most meritorious exhibit at the Chelsea Meeting was awarded to Messrs. Carters' Tested Seeds, Ltd., for their exhibit of Florists' flowers.

The Coronation Cup.—The Coronation Cup for the best exhibit other than Roses on the occasion of the Autumn Show at the Crystal Palace was awarded to Messrs. Bees, Ltd., for their mixed group of herbaceous plants, Chrysanthemums, Gladioli and Lilies.

Gifts to the Society.—The Council desires to express its gratitude to many Fellows and friends of the Society for their generosity in the gifts of books, seeds and plants. It desires to thank the New York Horticultural Society for the gift of a cup for competition at the Chelsea Show, which will be offered for the best group of Trees and Shrubs staged in the open. It further desires gratefully to record a gift of money from the trustees of the Société Française d'Horticulture de Londres, in commemoration of Mr. George Schneider, the interest of which is to be spent on the purchase of books for the Lindley Library, and a gift to Wisley of a collection of Rose species and hybrids, collected and presented by Dr. Hurst.

Retiring Members of Council.—The Council desires to record its appreciation of the valuable services rendered during their term of office by the retiring members of Council—Sir Daniel Hall, Mr. C. G. A. Nix and Mr. George Monro—and to thank them on behalf of the Society. The Council is glad to think that their help and advice will still be at the call of the Society and of the Committees of which they are members.

The Press.—The Council desires to express its thanks to the Press for the interest it has displayed in the affairs of the Society, and for its generous support of, and goodwill towards, Horticulture generally.

Committees, Judges and Examiners.—The best thanks of the Society are offered also to the members of the various Committees, to the judges and to the examiners, who have given to the Society most valuable counsel and assistance.

Staff.—The Council desires to express the Society's obligation to the Secretary and the staff both at Vincent Square and at Wisley for their loyal and diligent work.

Signed on behalf of the Council,

ABERCONWAY,
President.

December 31, 1934.

Dr.

ANNUAL REVENUE & EXPENDITURE ACCOUNT

		£	s.	d.	£	s.	d.
To ESTABLISHMENT EXPENSES—London.							
Rent, Rates and Taxes		3,122	4	9			
Salaries and Wages		7,160	15	5			
Other Establishment Expenses, including Light, Fuel, Stationery, Professional Fees, and Renewals		5,545	16	7			
„ WISLEY—					15,828	16	9
Net Expenditure for Year, as per separate Account					12,264	5	1
„ PRINTING AND POSTAGE OF JOURNAL AND OTHER PUBLICATIONS							
Less Sales and Advertisements		6,819	13	0			
		2,457	4	6			
					4,362	8	6
„ STAFF PENSIONS							
Less Contributions by Staff, as per Scheme		1,004	2	0			
		424	0	0			
„ MEETINGS—					580	2	0
Expenses and Labour of Special and Other Meetings		2,945	4	6			
Receipts		379	16	1			
		2,565	8	5			
Spring Meeting :							
Expenses and Labour	£6,050	16	9				
Sum allocated for Over- head Expenses	500	0	0				
		6,550	16	9			
Receipts	6,844	19	11				
					294	3	2
					2,271	5	3
Autumn Show :							
Expenses and Labour	2,295	1	3				
Sum allocated for Over- head Expenses	350	0	0				
		2,645	1	3			
Receipts	1,788	11	4				
					856	9	11
					3,127	15	2
„ CUPS AND MEDALS					636	18	11
„ GARDEN INSPECTIONS—							
Expenditure less Receipts					17	17	8
CONTRIBUTION TO LINDLEY LIBRARY, as per Trust Account—							
Purchase of Books		448	13	8			
Salaries, etc.		506	2	0			
„ SPECIAL EXPENDITURE—					954	15	8
E. K. Balls Expedition		50	0	0			
Donation, Royal Geographical Society		10	0	0			
„ British Colour Council		5	5	0			
„ London Children's Gardens		10	10	0			
„ Gardeners' Royal Benevolent Inst.		52	10	0			
„ Royal Gardeners' Orphan Fund		21	0	0			
„ William Cuthbertson Memorial Fund		25	0	0			
„ Leon Chenault Memorial Fund		6	13	0			
„ Rothamsted Experimental Station		105	0	0			
„ Ministry of Agriculture Publicity Committee		200	0	0			
„ East Malling Walnut Trials		50	0	0			
Pritzel Revision (Index Londinensis)		510	8	8			
Fruit Conference		173	6	5			
Addressograph Machine		609	2	1			
Appropriation Reserved for Journal Index		500	0	0			
					2,328	15	2
„ BOTANICAL MAGAZINE		576	16	5			
Add Work in Advance		698	0	4			
					1,274	16	9
Carried forward					£41,376	11	8

FOR THE YEAR ENDED 31st DECEMBER, 1934.

Cr.

	£	s.	d.	£	s.	d.
By ANNUAL SUBSCRIPTIONS				44,917	15	9
„ DIVIDENDS AND INTEREST	637	7	8			
„ Do. Do. DAVIS TRUST	51	8	10			
„ Do. Do. DEPOSIT INTEREST	76	8	2			
				<u>765</u>	4	8
„ DONATIONS					1	11 0
„ HALL LETTINGS, GROSS				5,601	11	6
„ LIFE COMPOSITIONS— Being amounts paid by Fellows who have died during the year				357	0	0
„ RENT OF FREEHOLD PROPERTY (Wisley)				270	0	6
„ PROFIT ON SALE AND REINVESTMENT OF GENERAL INVESTMENTS				182	1	1

Carried forward £52,095 4 6

Dr.

ANNUAL REVENUE & EXPENDITURE ACCOUNT

	£	s.	d.	£	s.	d.	£	s.	d.
Brought forward .	.	.	.	.	.	.	41,376	11	8
To EXAMINATIONS IN HORTICULTURE—									
Expenses . . . . .	.	.	.	.	.	.	573	7	0
Less Fees . . . . .	.	.	.	.	.	.	504	2	0
								69	5 0
„ GENERAL SCHOLARSHIPS . . . . .	.	.	.	.	.	.	101	16	0
Less Contribution from the Wor- shipful Company of Gardeners .	50	0	0						
Less Contribution from the Knott Scholarship Fund	30	0	0						
							80	0	0
								21	16 0
„ OLD AND NEW HALLS SINKING FUND APPRO- PRIATION . . . . .	.	.	.	.	.	.		3,366	0 0
„ RESTAURANTS—									
Proportion of Overhead Expenses . . . . .	.	.	.	.	.	.	772	18	6
Add Deficit . . . . .	.	.	.	.	.	.	66	5	7
								839	4 1
„ BALANCE being Excess of Revenue over Expen- diture carried to Balance Sheet								6,422	7 9
							<u>£52,095</u>	<u>4</u>	<u>6</u>

FOR YEAR ENDED 31st DECEMBER, 1934—continued.**Cr.**

	£	s	d.
Brought forward . . .	52,095	4	6

£52,095	4	6
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Dr.

ROYAL HORTICULTURAL SOCIETY—

LIABILITIES.

	£	s.	d.	£	s.	d.
CAPITAL FUNDS ACCOUNT	232,388	17	0			
<i>Add</i> General Investments transferred from General Revenue Account	7,592	3	1			
				239,981	0	1
LIFE COMPOSITIONS as at 31st December, 1933	14,117	5	0			
<i>Less</i> Fees paid by Life Fellows who have died during the year	357	0	0			
	13,760	5	0			
<i>Add</i> Life Compositions paid during the year	609	0	0			
				14,369	5	0
SUNDRY CREDITORS— On Open Accounts				3,100	14	4
APPROPRIATIONS AWAITING INVESTMENT— OLD AND NEW HALLS, SINKING FUND	2,386	0	0			
WISLEY DEPRECIATION AND RENEWALS FUND	250	0	0			
				2,636	0	0
SUBSCRIPTIONS PAID IN ADVANCE				701	18	6
DEPRECIATION AND RENEWALS FUND				10,000	0	0
OLD AND NEW HALLS SINKING FUND— As at 31st December, 1933	6,678	3	2			
Added to Fund, 1934	3,035	2	1			
<i>Add</i> Capital appreciation on Sale and Reinvestment of Securities	191	7	6			
				10,504	12	9
WEATHER INSURANCE FUND				3,000	0	0
SUPPLEMENTARY PENSION FUND— As at 31st December, 1933	1,917	7	1			
Added to Fund, 1934	332	18	11			
				2,250	6	0
RESERVE AGAINST DEPRECIATION OF INVEST- MENTS as at 31st December, 1933	1,680	19	4			
<i>Add</i> Capital appreciation on Sale and Re- investment of Securities in this Fund and in the Depreciation and Renewals Fund	283	3	0			
				1,964	2	4
MEMORIAL AND OTHER TRUST FUNDS— Balances in the hands of the Society as per Separate Schedule				413	8	4
REVENUE AND EXPENDITURE ACCOUNT— Balance as at 31st December, 1933	12,581	8	8			
<i>Add</i> Balance of Revenue and Expenditure Account, 31st December, 1934	6,422	7	9			
	19,003	16	5			
<i>Less</i> General Investments transferred to Capital Funds Account	7,592	3	1			
				11,411	13	4
				<u>£300,333</u>	<u>0</u>	<u>8</u>

BALANCE SHEET, 31st DECEMBER, 1934.

Cr.

ASSETS.

	£	s.	d.	£	s.	d.
CAPITAL EXPENDITURE—						
Old Hall, Offices, Restaurant, Library, and Equipment	77,642	0	0			
New Hall, Restaurant and Equipment	167,706	2	10			
				245,348	2	10
FREEHOLD PROPERTY, WISLEY				13,103	2	11
BOTANICAL MAGAZINE—						
Stock				100	0	0
DEPRECIATION AND RENEWALS FUND INVESTMENT AT COST				10,000	0	0
(Market value of Investments at 31st December, 1934, £10,688 5s. 10d.)						
OLD AND NEW HALLS SINKING FUND INVESTMENTS AT COST—						
Investments as at 31st December, 1933	6,678	3	2			
Invested during 1934	1,249	2	1			
Add Appreciation on Sale and Reinvestment	191	7	6			
(Market value of Investments at 31st December, 1934, £8,492 0s. 3d.)						
	8,118	12	9			
Add Appropriation awaiting Investment	2,386	0	0			
				10,504	12	9
WEATHER INSURANCE FUND INVESTMENTS AT COST				3,000	0	0
(Market value of Investments at 31st December, 1934, £3,290 11s. 8d.)						
SUPPLEMENTARY PENSION FUND INVESTMENTS AT COST—						
Investments as at 31st December, 1933	1,917	7	1			
Invested during 1934	332	18	11			
(Market value of Investments at 31st December, 1934, £2,879 8s. 8d.)						
				2,250	6	0
DEPRECIATION OF INVESTMENTS FUND INVESTMENTS AT COST—						
Investments as at 31st December, 1933	1,680	19	4			
Add Appreciation on Sale and Reinvestment of above Securities	75	9	0			
Add Appreciation on Sale and Reinvestment of Depreciation and Renewals Fund Investments	207	14	0			
(Market value of Investments at 31st December, 1934, £2,063 8s. 0d.)						
				1,964	2	4
WISLEY ADJUSTMENT ACCOUNT				557	18	9
SUNDRY DEBTORS AND PAYMENTS IN ADVANCE				3,655	8	4
CASH AT BANK AND IN HAND				2,257	3	8
GENERAL INVESTMENTS AT COST—						
Investments as at 31st December, 1933	7,410	2	0			
Add Appreciation on Sale and Reinvestment	182	1	1			
(Market value of Investments at 31st December, 1934, £8,023 7s. 9d.)						
				7,592	3	1
				<u>£300,333</u>	<u>0</u>	<u>8</u>

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position of the Society on the 31st December, 1934. In the total of Assets, £300,333 0s. 8d., are included Investments and Cash amounting in all to a total sum of £28,132 9s. 5d., representing Depreciation and other Funds which are not available for the general purposes of the Society.

J. S. FEATHER, F.C.A., Auditor
(HARPER, FEATHER & PATERSON, Chartered Accountants),
35 Great Tower Street, London, E.C. 3.

3rd January, 1935.

Dr.

WISLEY GARDENS—REVENUE & EXPENDITURE**To ESTABLISHMENT EXPENSES—**

	£	s.	d.	£	s.	d.
Salaries and Wages	2,155	11	6			
Rates, Taxes and Insurance	375	8	0			
Miscellaneous, including Donations	852	8	1			
Annuities	91	0	0			
				3,474	7	7

„ LABORATORY AND SCHOOL OF HORTICULTURE—

Salaries	2,219	18	4			
Miscellaneous	122	13	9			
Depreciation	72	14	10			
				2,415	6	11

„ GARDEN—

Salaries and Wages	6,457	19	9			
Plant Distribution	966	6	7			
Miscellaneous	1,055	0	9			
Depreciation	423	18	11			
				8,903	6	0

„ STAFF PENSIONS

	505	3	7			
Less Contributions by Staff, as per Scheme	252	12	0			
				252	11	7
				£15,045	12	1

To BALANCE, brought down

11,931 6 10

„ SPECIAL EXPENDITURE—

Spraying Machine, Fruit Trials	89	9	0			
Fire Appliances	141	9	3			
New Herbaceous Border	102	0	0			
				332	18	3
				£12,264	5	1

ACCOUNT FOR YEAR ENDED 31st DECEMBER, 1934.

Cr.

	£	s.	d.	£	s.	d.
By DIVIDENDS AND INTEREST				1,096	6	1

„ CONTRIBUTIONS TO FRUIT TRIALS, 1933—

Ministry of Agriculture (Balance)	125	0	0			
National Farmers' Union	119	10	0			
Worshipful Company of Fruiterers	25	0	0			
Lord Wolmer	3	3	0			
				272	13	0

„ GARDEN—

Sales and Miscellaneous Receipts	846	15	1			
Prepaid Distribution, Postages and Packing Fees	898	11	1			
				1,745	6	2

„ BALANCE, carried down				11,931	6	10
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£15,045 12 1

„ BALANCE, being Net Expenditure for year, carried to the Annual Revenue and Expenditure Account

12,264 5 1

£12,264 5 1

Dr.

WISLEY GARDENS—BALANCE**LIABILITIES.**

	£	s.	d.	£	s.	d.
CAPITAL FUNDS ACCOUNT				35,870	7	8
VINCENT SQUARE ADJUSTMENT ACCOUNT				557	18	9
ENDOWMENT TRUST FUND—						
As at 31st December, 1933	23,226	16	11			
Add Capital Appreciation on Sale and Re- investment of Securities	266	4	8			
				23,493	1	7
DEPRECIATION AND RENEWALS FUND—						
As at 31st December, 1933	7,514	6	5			
Add Capital Appreciation on Sale and Re- investment of Securities	135	7	11			
Added to Fund, 1934	250	0	0			
				7,899	14	4

£67,821 2 4

ASSETS.

	£	s.	d.	£	s.	d.
CAPITAL EXPENDITURE—						
Laboratory, Dwelling Houses, Glass Houses, Ranges, etc.				33,371	10	10
N.B.—The Hanbury Trust Estate is, under the Trust Deed, vested in the Society only so long as it is in a position to use it as an Experimental Garden. Accordingly the Expenditure thereon by the Society is an Asset only so long as the Gardens continue to be used by the Society.						
FUEL STOCK				51	0	0
PLANT, LIVE STOCK AND LOOSE EFFECTS (as valued by the Director)—						
As at 31st December, 1933	2,519	11	6			
Add Purchases during 1934	120	18	1			
	2,640	9	7			
Less Depreciation of Garden and Laboratory	246	13	9	2,393	15	10
LIBRARY—						
As at 31st December, 1933	562	7	6			
Additions during 1934	49	12	3	611	19	9
ENDOWMENT TRUST FUND INVESTMENTS AT COST—						
Investments as at 31st December, 1933	22,748	4	3			
Add Appreciation on Sale and Re-investment	266	4	8			
(Market value of Investments at 31st December, 1934, £25,105 11s. 11d.)						
	23,014	8	11			
Add Cash awaiting Investment	478	12	8	23,493	1	7
DEPRECIATION AND RENEWALS FUND INVESTMENTS AT COST—						
Investments as at 31st December, 1933	7,514	6	5			
Add Appreciation on Sale and Reinvestment	135	7	11			
„ Appropriation awaiting Investment	250	0	0			
(Market value of Investments at 31st December, 1934, £9,362 19s. 5d.)				7,899	14	4
				£67,821	2	4

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position on the 31st December, 1934. In the total of Assets, £67,821 2s. 4d., are included Investments, Cash, and an Appropriation amounting in all to a total sum of £31,392 15s. 11d., representing Endowment and Depreciation Funds which are not available for the general purposes of the Society.

J. S. FEATHER, F.C.A., Auditor
(HARPER, FEATHER & PATERSON, Chartered Accountants),
35 Great Tower Street, London, E.C. 3.

3rd January, 1935.

ROYAL HORTICULTURAL SOCIETY—TRUST

	Amount of Fund represented by Investments at Cost.			Income Balance in hand 31st Dec., 1933.		
	£	s.	d.	£	s.	d.
1. ALFRED DAVIS TRUST FUND	946	0	3			<i>nil</i>
2. WILLIAMS MEMORIAL FUND	246	6	10	15	2	6
3. MASTERS MEMORIAL FUND	542	17	0	124	10	10
4. NICHOLSON MEMORIAL FUND	196	1	5			<i>nil</i>
5. SCHRÖDER PENSION FUND	557	14	6	6	6	8
6. LINDLEY LIBRARY TRUST	12,940	11	4 (a)			<i>nil</i>
7. SIR JAMES KNOTT TRUST	600	0	0	94	7	3
8. VEITCH MEMORIAL TRUST FUND	1,718	3	7 (1)	163	1	0
9. MOORE MEDAL TRUST	190	10	6	12	12	11
10. SEWELL MEDAL TRUST FUND	527	10	3	1	15	8
11. MRS. SHERMAN HOYT PRIZE FUND	207	7	10	15	15	1
12. LORD RIDDELL TROPHY FUND	175	0	0	0	16	6
13. DEDICATIONS VOLUME FUND (Botanical Magazine)	139	4	6	26	12	2

Notes on above Funds :

1. Bequeathed to the Society in 1870 for annual prizes or any other object the Council may determine.

2. Raised by donations in 1891 in memory of the late Mr. B. S. Williams towards the provision of prizes and medals.

3. Raised by donations in 1908 in memory of the late Dr. Masters towards the provision of one or more annual lectures.

4. Raised by donations in 1908 in memory of the late Mr. Geo Nicholson to provide prizes for Wisley students.

5. Provided by the Society in memory of the late Baron Schröder to pay to the Gardeners' Royal Benovolent Institution for one pension.

6. The nucleus of the library is the fine collection of books and pamphlets which belonged to the late Dr. Lindley. It has since been added to by the books purchased by the Society and by the gifts of private donors.

FUND ACCOUNTS, 31st DECEMBER, 1934.

Dividends and Interest received during 1934.			Expenditure in 1934 in accordance with the Trust.			Income Balance in hands of R.H.S. 31st Dec., 1934.						
£	s.	d.	£	s.	d.	£	s.	d.		£	s.	d.
51	8	10	51	8	10	nil			(a) Investment	1,458	15	7
9	19	2	8	16	0	16	5	8	Cost of Books purchased by the Society up to 31st Dec., 1933	10,983	2	1
20	0	0	20	0	0	124	10	10	Books purchased by the Society in 1934	448	13	8
5	8	10	5	8	10	nil			Georges Schneider Memorial Fund donated through Mrs. Peavot	50	0	0
20	0	0	20	0	0	6	6	8				
551	11	7 (b)	551	11	7	89	10	3				
25	3	0	30	0	0	125	11	11				
07	3	5	104	12	6	11	5	11				
7	16	6	9	3	6	0	9	5				
23	12	3	24	18	6	15	19	8				
10	8	1	10	3	6	2	14	3	(b) Includes contribution by the Society in 1934, £506 2s. 0d.			
7	12	9	5	15	0				(c) Includes proceeds of sales during 1934 amounting to £16 to be invested.			
20	13	9 (c)	26	12	2	20	13	9	(d) Includes bonus on conversion of Victoria Government 5% Stock £40 12s. 5d. to be invested.			
Total as per Balance Sheet						£413	8	4				

7. Presented to the Society in 1920 by the late Sir James Knott for the purpose of providing a scholarship tenable at Wisley.

8. Instituted in 1870 in commemoration of the late Mr. James Veitch for the encouragement of Horticulture. Fund vested in Society in 1922.

9. Presented to the Society in 1926 by the late Mr. G. F. Moore to provide a medal annually for the best new *Cypripedium* shown to the Society during the year.

10. Presented to the Society in 1928 by the late Mr. A. J. Sewell to provide medals for Rock Garden Plants.

11. Presented by Mrs. A. Sherman Hoyt in 1929 as a donation and funded by the Society to provide prizes for the encouragement of the growth of Cacti and Succulents.

12. Presented by the late Lord Riddell in 1931 to provide a trophy annually to be awarded for vegetables.

13. Proceeds of the sale of Curtis's Botanical Magazine Dedications, 1827-1927, presented in 1932 to the Society by the late Mr. William Cuthbertson, V.M.H., to be devoted to publications.

GENERAL MEETINGS.

NOVEMBER 6, 1934.

Silver-gilt Grenfell Medal.

To Lieut. J. P. W. Furse, R.N., 10 Bramley Flats, Alverstone, Hants, for paintings of Lilies.

Silver Grenfell Medal.

To Miss D. Ratman, 46 Belgrave Road, S.W. 1, for flower paintings.

To Mr. H. A. Thompson, St. Margarets, Church Hill, Loughton, for drawings of flowers.

Grenfell Medal.

To Miss G. Dorrien Smith, Fishbourne House, Wootton Bridge, I.W., for paintings of flowers and gardens.

To Mrs. Norman Stone, Eeyores, Horsham Road, Cranleigh, for flower paintings.

To Miss Winifred Walker, 25 Tanza Road, Hampstead, N.W. 3, for flower paintings.

Report of Deputation to Harrogate Jubilee Flower Show, September 5-7, 1934.

The following awards were made on the recommendation of the Deputation consisting of Mr. G. W. LEAK, V.M.H., Mr. W. R. OLDHAM, and the Secretary.

Gold Medal.

To Messrs. Dickson & Robinson, Manchester, for a group of Dahlias.

To The Backhouse Nurseries, Ltd., York, for a rock garden in the open.

Silver-gilt Flora Medal.

To Messrs. Dobbie, Edinburgh, for a group of Gladioli.

To Messrs. Dowty, Wokingham, Berks, for a group of Roses.

To Messrs. Fisher, Son & Sibray, Sheffield, for shrubs.

To Messrs. Conway, Yorkshire, for a rock garden in the open.

Silver-gilt Banksian Medal.

To Messrs. Allwood, Haywards Heath, for a group of Carnations.

To Messrs. Blackmore & Langdon, Bath, for a group of Begonias.

To Messrs. Wm. Lowe, Beeston, Notts., for Roses.

Silver-gilt Hogg Medal.

To Messrs. Pennell, Lincoln, for a group of fruit.

Silver-gilt Knightian Medal.

To Messrs. Carters' Tested Seeds, Raynes Park, S.W., for a group of vegetables.

NOVEMBER 27, 1934.

Silver-gilt Grenfell Medal.

To Lieut. J. P. W. Furse, R.N., 10 Bramley Flats, Alverstone, Hants, for paintings of Lilies.

Silver Grenfell Medal.

To Miss D. Ratman, 46 Belgrave Road, S.W. 1, for flower paintings.

To Mrs. A. C. Reeve-Fowkes, 9 Borough Lane, Eastbourne, for flower paintings.

Grenfell Medal.

To Miss G. Dorrien Smith, Fishbourne House, Wootton Bridge, I.W., for flower paintings.

To Miss G. Thomasset, 11 St. Mildred's Road, Lee, for flower paintings.

To Miss W. Walker, 25 Tanza Road, N.W. 3, for flower paintings.

A lecture was given by Dr. A. B. RENDLE, M.A., D.Sc., F.R.S., F.L.S., V.M.H., on "My Visit to Bermuda."

Chairman, Sir ARTHUR HILL, K.C.M.G., Sc.D., F.R.S.

DECEMBER 11, 1934.

Silver-gilt Grenfell Medal.

To Lieut. J. P. W. Furse, R.N., 10 Bramley Flats, Alverstone, Hants, for Lily paintings.

Grenfell Medal.

To Miss D. Ratman, 46 Belgrave Road, S.W. 1, for flower paintings.

To Mrs. Norman Stone, Eeyores, Horsham Road, Cranleigh, for flower paintings.

SCIENTIFIC COMMITTEE.

November 6, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eight other members present.

Zelkova in fruit.—Mr. E. G. Baker reported that the tree of which he took a piece at the last meeting was *Zelkova crenata*, which was fruiting freely; the *Mimulus* from the Grand Canyon sent by Mr. Collingwood Ingram proved to be *Mimulus cardinalis*.

Salix sp.—Mr. Fraser showed specimens of Willows, including *Salix arbuscula angustifolia*, the narrowest-leaved British Willow.

Walnuts holed.—Mr. P. Bunyard sent Walnuts with two holes near the apex, one on each side of the shell, which he attributed to rooks, which, he said, made the holes for ease of carrying. The shells were extremely thin.

Oak galls opened by woodpeckers.—He also showed marble-galls of Oak opened by green woodpeckers, and an example of

Larder of red-backed shrike, with Bumble bees spiked upon the thorns of Aegle.

Crataego-Mespilus graft hybrids.—Mr. M. B. Crane showed a series of specimens in fruit of the following graft hybrids of *Crataegus* and *Mespilus* showing fruits progressively more like *Mespilus*: *C.-M. × Asnieresii*, *C.-M. × Dodartii*, *C.-M. × Lotysii*, *C.-M. × Batesonii*.

Cassia, white-flowered.—Mr. Baker showed a species of *Cassia* with white flowers, a contrast with the great part of the genus, in which they are yellow.

November 27, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

Adenophora sp.—Mr. Chittenden reported that the species of *Adenophora* from Formosa, sent on October 23 by Mr. Collingwood Ingram for identification, had been referred to the authority on this group in Sweden, who regarded it as a new species.

Persistent weeds.—Mr. J. Fraser referred to the persistence of certain introduced species of *Polygonum* at Kew, and instanced *P. alpestre*, which was found in an old pit at Kew in 1872 and remained until 1923, when it was covered by concrete, and to *P. Sieboldii*, which came up in a newly erected house between the wainscot and the wall. Mr. Bowles remarked upon the difficulty of keeping *P. amphibium* in bounds in ordinary soil.

Branched leaf of Skimmia japonica.—Mr. Chittenden showed a leaf of *Skimmia japonica* in which the mid-rib had branched and produced a bifurcated lamina.

Double Odontoglossum.—Mr. Hanbury showed a double-flowered *Odontoglossum*, the first flower on a new seedling, which he had named 'Picotee.'

Mr. Fraser identified a Willow sent for naming as *Salix blanda*, a hybrid between *S. babylonica* and *S. fragilis*, known in nurseries also as *S. elegantissima* and *S. Salamonii*.

December 11, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and four other members present.

Salix × Paulinae.—Mr. Fraser exhibited a hybrid Willow from material growing in the Royal Botanic Gardens, Edinburgh, viz. *Salix × Paulinae* (*S. arbuscula × reticulata*) found in the Tyrol, Sweden and Switzerland, and having most of the catkins terminal as in *S. arbuscula*, with the serrated round base of leaf of *S. reticulata*.

Gladiolus sp.—From Floral Committee B. two small interesting *Gladioli* were sent—*G. jongquiodorus* Ecklon, from S. Africa (Cape Province), and *G. brevifolius*, S. Africa (Cape Peninsula). They were exhibited by T. T. Barnard, Esq., Furzebrook House, Wareham, Dorset.

FRUIT AND VEGETABLE COMMITTEE.

November 6, 1934, Mr. E. A. BUNYARD, F.L.S., in the Chair, and twelve other members present.

Exhibits.

Mr. F. Woolford, Swindon : Seedling Apple.
Mr. R. Southwick, York : Seedling Apple.
Mr. C. Howlett, Earley : Seedling Pear, and Apples ' Strawberry Pippin,'
' Melon Apple,' ' Lewis's Incomparable.'
Mr. A. G. C. Pugh, London, W.C. 1 : Apples ' Ilrood Pigeon ' and an unnamed
variety grown in Denmark.
Mr. T. A. Cunningham, Oundle : Seedling Apple.
Messrs. Laxton, Bedford : Apple ' Laxton's Sensation.'
Mr. W. Fordham, Dorking : Seedling Apple.
Mr. W. H. Divers, V.M.H., Hook : Apple ' Radford Beauty.'
John Innes Hort. Inst., Merton : Seedling Apples, Nos. 911, 920, 925, 1090,
and Seedling Pear.

November 27, 1934, Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Awards Recommended :—

Silver-gilt Hogg Medal.

To Messrs. J. Cheal, Crawley, for collection of Apples and Pears.

Silver Hogg Medal.

To Messrs. Laxton, Bedford, for collection of Apples.

Other Exhibits.

North Harrow Nurseries, Middlesex : collection of Apples.
Mr. A. J. Snell, Grimsby : Seedling Apples.
Mr. H. G. Moore, Dorchester : Seedling Apple.
Mr. F. H. Bowden, Torquay : Apple ' Bowden's Seedling.'
Mr. F. Pye, Ferndown : Apple ' Arthur Lewis.'
Mr. E. A. Bunyard, Allington : Apple ' Damasena Reinette.'
R.H.S. Gardens, Wisley : Brussels Sprouts and Celeriac recommended for
Award after trial at Wisley.

December 11, 1934, Mr. E. A. Bunyard, F.L.S., in the Chair, and nine other members present.

Exhibits.

Mr. R. A. Whiting, Hawley : Seedling Apples, Nos. 1, 2, 3, 4.
Mr. W. H. Divers, V.M.H., Hook : Apple ' Scarlet Pearmain ' and ' Orange
Pippin.'
Viscountess St. Cyres, Lymington : *Actinidia chinensis*.
Mr. H. Lagden, Brentwood : Seedling Apple.
Mr. S. W. Hayes, Bicester : Apple ' Duchess of Kent.'
Mr. F. Bostock, Northampton : Apple ' Ashmead's Kernel.'

FLORAL COMMITTEE A.

November 6, 1934, Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—*Gold Medal.*

To J. Pierpont Morgan, Esq. (gr. Mr. F. A. Steward), Watford, for Begonias.
To Messrs. Sutton, Reading, for Cyclamen.

Silver-gilt Banksian Medal.

To the Hon. Mrs. C. Lambton (gr. Mr. A. R. Brumby), Mortimer, for Begonias.

Silver Flora Medal.

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.
To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Silver Banksian Medal.

To Messrs. Low, Enfield, for Carnations.

Flora Medal.

To Messrs. Barr, London, for Nerines.
To Messrs. Engelmann, Saffron Walden, for Carnations.

Award of Merit.

To Chrysanthemum 'Biterre' for exhibition (votes unanimous), from Messrs. Luxford, Sawbridgeworth. See p. 84.

To Chrysanthemum 'Bridgwater Beauty' for cutting and market (votes 12 for, 3 against), from Mr. J. A. Barrell, Bridgwater. See p. 84.

To Chrysanthemum 'Bronzelight' for cutting and market (votes unanimous), from Mr. J. A. Barrell, Bridgwater. See p. 84.

To Chrysanthemum 'Florence Woodward' for exhibition (votes unanimous), from Messrs. Luxford, Sawbridgeworth. See p. 85.

To Chrysanthemum 'Madelon' for exhibition (votes unanimous), from Messrs. Luxford, Sawbridgeworth. See p. 85.

To Chrysanthemum 'Pose' for cutting and market (votes unanimous), from Mr. J. A. Barrell, Bridgwater. See p. 85.

Other Exhibits.

Messrs. Allwood, Haywards Heath : Carnations.

Mr. R. E. Blanchard, Thornton Heath : Chrysanthemum 'Kitty Gilman.'

Dame Alice Godman, D.B.E., Horsham : Nerine 'Mrs. Newman.'

C. J. Howlett, Esq., Earley : Chrysanthemum 'H. C. Loader.'

Mr. A. H. Huggins, Englefield Green : Chrysanthemum 'November Glow.'

B. Rubenstein, Esq., Rustington : Chrysanthemums 'Ann Lebus' and 'W. Turnham.'

November 27, 1934, Mr. J. M. BRIDGEFORD in the Chair, and sixteen other members present.

Awards Recommended :—*Silver-gilt Banksian Medal.*

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.

Silver Flora Medal.

To Mr. J. W. Forsyth, Putteridge, for Cyclamen.

To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Silver Banksian Medal.

To Messrs. H. J. Jones, Lewisham, for Chrysanthemums.

Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations and *Lachenalia Boundii*.

To Messrs. S. Low, Enfield, for Carnations and other greenhouse plants.

Award of Merit.

To Chrysanthemum 'Avondale Sunset' for cutting and market (votes 9 for, 1 against), from Messrs. Tyson, Crawley. See p. 84.

To Chrysanthemum 'Hildene' for cutting and market (votes unanimous), from Mrs. M. Emery, Flitwick, Beds. See p. 85.

To Chrysanthemum 'Printemps d'Amour' for cutting and market (votes 12 for), from Mr. T. Stevenson, Hillingdon. See p. 85.

Other Exhibits.

- A. E. Abraham, Esq., Wimbledon : Chrysanthemum 'Mrs. R. Luxford.'
 Sir Henri Deterding, Ascot : Chrysanthemum 'Lady Deterding.'
 Mr. C. H. Kettle, Corfe Mullen : Violets.
 G. Temple, Esq., Birmingham : Chrysanthemum 'White King.'

December 11, 1934, Mr. G. W. LEAK, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Baron Bruno Schröder (gr. Mr. E. J. Henderson), Englefield Green, for Begonias.

Silver Banksian Medal.

To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Flora Medal.

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.

Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Engelmann, Saffron Walden, for Carnations and *Lachenalia Boudii*.

To Messrs. Toogood, Southampton, for Cyclamen.

Award of Merit.

To Chrysanthemum 'Apricot Favourite' for cutting and market (votes 8 for) from Mr. J. A. Macleay, Ayr. See p. 84.

To Chrysanthemum 'Jane Ingamells' for cutting and market (votes 14 for), from Mr. T. Stevenson, Hillingdon. See p. 85.

To Chrysanthemum 'Nellie Ross' for cutting and market (votes 12 for, 1 against), from Mr. T. Stevenson, Hillingdon. See p. 85.

To Chrysanthemum 'Oak Leaf' for cutting and market (votes 10 for, 5 against), from Mr. T. Stevenson, Hillingdon. See p. 85.

To Begonia 'Gloire de Lorraine,' var. 'Mis J. Petersen,' as a greenhouse flowering plant (votes 11 for), from Baron Bruno Schröder (gr. Mr. E. J. Henderson), Englefield Green. See p. 84.

Cultural Commendation.

To Mr. E. J. Henderson, gardener to Baron Bruno Schröder, Englefield Green, for a magnificent plant of Begonia 'Gloire de Lorraine,' var. 'Mrs. Leopold de Rothschild,' A.M. 1899.

Other Exhibit.

Captain G. B. Witts, Wotton-under-Edge : Chrysanthemum sport.

FLORAL COMMITTEE B.

November 6, 1934, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. W. B. Cranfield, East Lodge, Enfield, for hardy ferns.

Silver Banksian Medal.

To Lady Lawrence, Dorking, for hardy shrubs.

Banksian Medal.

To Messrs. Hillier, Winchester, for shrubs.

To Messrs. Russell, Richmond, for shrubs and stove plants.

To W. G. Theobald, Esq., Steyning, for succulents.

First-class Certificate.

To *Pyracantha Rogersiana aurantiaca* as a hardy, ornamental-fruiting shrub (votes 12 for), from Lionel de Rothschild, Esq., Exbury. See p. 87.

Award of Merit.

To *Clerodendron splendens* as a flowering shrub for the greenhouse (votes 11 for), from Messrs. L. R. Russell, Richmond. See p. 85.

To *Gentiana rigescens* as a hardy flowering plant (votes 12 for), from Lionel de Rothschild, Esq., Exbury. See p. 86.

To *Idesia polycarpa* as a hardy, ornamental-fruiting tree (votes unanimous), from Lord Wakehurst, Ardingly. See p. 86.

To *Phyllitis Scolopendrium crispum splendens* as a hardy fern (votes 14 for), from Mr. W. B. Cranfield, Enfield. See p. 86.

To *Viburnum foetidum* as a hardy, ornamental fruiting shrub (votes unanimous), from Lionel de Rothschild, Esq., Exbury. Shown Oct. 23, 1934. See p. 87.

To *Geranium Donianum* as a hardy flowering plant (votes 14 for), from T. Hay, Esq., Hyde Park, W. Shown June 12, 1934. See p. 86.

Other Exhibits.

Lord Aberconway, Bodnant : *Liriope Muscari*, *Banksia collina*.

Messrs. Clark, Dover : shrubs and hardy flowers.

J. W. Ford, Esq., Bagshot : *Prunus Laurocerasus* seedling.

Dr. P. L. Giuseppe, Felixstowe : *Diosphaera tubulosa*.

Mrs. Vera Higgins, Croydon : *Ceropegia Sandersonii*.

Miss Hopkins, Coulsdon : rock plants.

Lady Lawrence, Dorking : *Oxalis* sp.

Nat. Rose Society, Haywards Heath : *Rosa Willmottiae* × *R. Webbiana*.

Messrs. Russell, Richmond : *Dipladenia Brearlyana* seedling.

Major F. C. Stern, Goring-by-Sea : *Berberis Wilsonae* var. *Slapfiana*.

Lord Wakehurst, Ardingly : *Rosa Soulieana*.

November 27, 1934, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Neale, Newhaven, for *Gazanias* and succulents.

Banksian Medal.

To Messrs. D. Stewart, Ferndown, for hardy shrubs.

Award of Merit.

To *Pentapterygium rugosum* as a flowering shrub for the cool house (votes 9 for, 2 against), from Miss G. Waterer, Ludgvan, Long Rock, Cornwall (see p. 86).

Other Exhibits.

Lady Berry, Slough : *Callicarpa purpurea*.

Collingwood Ingram, Esq., Benenden : *Taxus baccata fructu-luteo*, large-fruited form.

A. P. Keep, Esq., Holmwood : *Fatsia japonica*.

Mr. H. Marcham, Carshalton : *Eleutherococcus Henryi*.

Lt.-Col. L. C. R. Messel, O.B.E., Handcross : *Cotoneaster conspicua*.

W. T. Rimer, Esq., Warkworth : *Berberis* seedlings.

Lionel de Rothschild, Esq., Exbury : *Freylinia cestroides*.

Dr. & Mrs. Fred Stoker, Loughton : *Arbutus Menziesii*.

The Director, R.H.S. Gardens, Wisley : *Berberis Soulieana*, *Aster Pappiei*.

December 11, 1934, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended :—

Banksian Medal.

To Messrs. L. R. Russell, Richmond, for stove plants.

Award of Merit.

To *Billbergia vittata* as a flowering plant for the greenhouse (votes 9 for, 3 against), from Messrs. L. R. Russell. See p. 84.

Other Exhibits.

T. T. Barnard, Esq., Wareham : *Gladiolus jonquilodorus*, *G. brevifolius*.

Lady Boles, Taunton : *Cornus capitata*.

W. Balfour Gourlay, Esq., Cambridge : *Galanthus latifolius rizaensis*.

Miss Hopkins, Coulsdon : hardy plants.

Collingwood Ingram, Esq., Benenden : large-fruited form of *Taxus baccata fructu-luteo*.

National Rose Society, Haywards Heath : *Rosa cerasocarpa*.

Messrs. Neale, Newhaven : succulents and *Gazanias*.

Lionel de Rothschild, Esq., Exbury : *Stranvaesia glaucescens*.

Viscountess St. Cyres, Lyminster : *Myrtus Ugni*.

ORCHID COMMITTEE.

September 19, 1934, Sir JEREMIAH COLMAN, Bt., in the Chair, and seventeen other members present.

Award of Merit.

To *Laeliocattleya* × 'Adonis' var. *magnifica* (L.-c. × *lustrissima* × L.-c. × 'Morvyth') (votes 14 for), from Messrs. H. G. Alexander, Tetbury. See vol. 59, p. 484.

To *Laeliocattleya* × 'Berenice' var. 'Empress' (L.-c. × 'Lustre' × L.-c. × 'Mme. Brasseur Hye') (votes 12 for, 1 against), from Messrs. Alexander. See vol. 59, p. 484.

To *Brassolaeliocattleya* × 'Stanley Dunn' var. 'Buttercup' (B.-l.-c. × 'J. M. Black' × L.-c. × 'Jean') (votes 10 for, 5 against), from M. L. Wells, Esq., Chiddingfold, Surrey. See vol. 59, p. 482.

To *Cattleya* × 'Prince of Wales' ('Bletchley Prince' × 'Empress Frederick') (votes unanimous), from Messrs. Sanders, St. Albans. See vol. 59, p. 482.

To *Odontoglossum grande* var. *citrinum* (votes 12 for), from Messrs. Sanders.

Preliminary Commendation.

To *Oncidium* × *crowboroughense* (*Oncidium varicosum* × *Odontoglossum Uro-Skinners*) (votes 13 for, 4 against), from Messrs. Stuart Low, Jarvis Brook, Crowborough. An immature seedling with a semi-pendulous spike of 7 flowers, the flat labellum being cream-white uniformly marked with numerous brown spots.

October 9, 1934, Sir JEREMIAH COLMAN, Bart., in the Chair, and thirteen other members present.

Awards Recommended :—

Award of Merit.

To *Laeliocattleya* × 'Bali' (votes unanimous), from N. Prinsep, Esq., The Boxes, Pevensey, Sussex. See vol. 59, p. 484.

To *Laeliocattleya* × 'Angela' (votes 9 for, 4 against), from Messrs. McBean, Cooksbridge, Sussex. See vol. 59, p. 484.

Cultural Commendation.

To Messrs. McBean for *Cattleya* × 'Adula' with three many-flowered spikes ; and for *Brassolaeliocattleya* × 'Heather Queen,' with three vigorous growths, each bearing a couple of large flowers.

Other Exhibits.

Messrs. Sanders, St. Albans : a group.

Messrs. Charlesworth, Haywards Heath : a group.

Messrs. McBean : a group.

October 23, 1934, Sir JEREMIAH COLMAN, Bart., in the Chair, and twenty other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Stuart Low, Jarvis Brook, for a group.

To Messrs. Charlesworth, Haywards Heath, for a group.

To Messrs. McBean, Cooksbridge, for a group.

Silver Banksian Medal.

To Sir Jeremiah Colman, Bart., Gatton Park, Surrey, for a group.

To F. J. Hanbury, Esq., Brockhurst, East Grinstead, for a group.

To Messrs. H. G. Alexander, Tetbury, for a group.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.

To Messrs. Sanders, St. Albans, for a group.

To Messrs. Black & Flory, Slough, for a group.

Banksian Medal.

To T. O. Stevens Perry, Esq., Hartland, Byfleet, for a group.

To Messrs. Harry Dixon, Wandsworth Common, for a group.

Award of Merit.

To *Laeliocattleya* × 'Mysia' (L.-c. × 'Senate' × L.-c. × 'Sylph') (votes 18 for, 2 against), from Messrs. Charlesworth, Haywards Heath. See vol. 59, p. 485.

Cultural Commendation.

To Mr. G. A. Bruton, gardener to Mrs. Haddon, Havelock House, Honor Oak Road, London, S.E. 23, for a well-flowered plant of *Oncidium incurvum*.

Other Exhibits.

Cypripedium Charlesworthii, from Chas. Bedbrook, Esq., "Iona," Marchmont Road, Wallington, Surrey.

November 6, 1934, Sir JEREMIAH COLMAN, Bart., in the Chair, and fourteen other members present.

Awards Recommended :—*Award of Merit.*

To *Lycaste fimbriata* (votes 11 for, 2 against), from Messrs. Sanders, St. Albans. See p. 86.

Other Exhibits.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

Messrs. Sanders, St. Albans : a group.

Messrs. Charlesworth, Haywards Heath : a group.

Messrs. Black & Flory, Slough : a group.

Messrs. H. G. Alexander, Tetbury : a group.

Messrs. McBean, Cooksbridge : a group.

Messrs. Stuart Low, Jarvis Brook : a group.

Baron Bruno Schröder, Englefield Green : *Laeliocattleyas*.

November 27, 1934, Sir JEREMIAH COLMAN, Bart., in the Chair, and eighteen other members present.

Awards Recommended :—*Silver-gilt Banksian Medal.*

To Messrs. McBean, Cooksbridge, for a group of *Zygopetalum intermedium*.

First-class Certificate.

To *Calanthe* × 'Brunton' var. 'Margaret Cookson' (votes 9 for), from Clive Cookson, Esq., Hexham. See p. 84.

Award of Merit.

To *Calanthe* × 'Gerald' var. 'Darkie' (votes 11 for, 5 against), from Clive Cookson, Esq. See p. 84.

To *Cypripedium* × 'Welcome' var. 'Alpha' (votes 16 for, 2 against), from Messrs. Sanders, St. Albans. See p. 85.

To *Brassolaeliocattleya* × 'Nanette' var. 'Model' (votes 11 for, 4 against), from Messrs. Stuart Low. See p. 84.

Cultural Commendation.

To Messrs. McBean, Cooksbridge, for *Zygopetalum intermedium*.

Other Exhibits.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

Messrs. Black & Flory, Slough : a group.

Messrs. Sanders, St. Albans : a group.

Messrs. H. G. Alexander, Tetbury : a group.

Messrs. Stuart Low, Jarvis Brook : a group.

Messrs. Charlesworth, Haywards Heath : a group.

Messrs. McBean, Cooksbridge : a group.

A. M. Wells, Esq., Chiddingfold : *Cypripedium* × 'Euryostom.'

G. P. Harben, Esq., Tower Brook, Hants : *Cypripedium* × 'Bittern.'

December 11, 1934, Sir JEREMIAH COLMAN, Bart., in the Chair, and fourteen other members present.

Awards Recommended :—*First-class Certificate.*

To *Sophrolaeliocattleya* × 'Nanette' var. 'Excelsa' (*S.-I.-c.* × 'Meuse' × *C.* × 'Dinah') (votes 12 for, 2 against), from Messrs. McBean, Cooksbridge, Sussex. See p. 87.

Award of Merit.

To *Odontoglossum* × 'Melindrum,' Prinsep's var. (*crispum* × 'Réve d'or') (votes unanimous), from N. Prinsep, Esq., The Boxes, Pevensey Bay, Sussex. See p. 86.

To *Cattleya* × 'Suavior' var. *splendens* (*intermedia* × *Mendelii*) (votes unanimous), from Messrs. Charlesworth, Haywards Heath. See p. 84.

To *Cypripedium* × 'Camelot' ('Phantasy' × 'Walter Moore') (votes 10 for, 5 against), from L. de Rothschild, Esq., Exbury, Southampton. See p. 85.

Cultural Commendation.

To Messrs. Charlesworth, for *Angraecum gracilipes*.

Other Exhibits.

Messrs. Charlesworth : a group.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

Messrs. H. G. Alexander, Tetbury : a group.

Messrs. Stuart Low, Jarvis Brook : a group.

F. J. Hanbury, Esq., East Grinstead : *Odontoglossum* × 'Duchess of York.'

S. G. Brown, Esq., Shepperton : *Cypripedium* hybrids.

L. de Rothschild, Esq. : *Calanthe* × 'Anita.'

JOINT DELPHINIUM COMMITTEE.

June 19, 1934, Mr. J. B. RIDING in the Chair, and six other members present.
Exhibit.

Delphinium 'Tommy Bones,' from Mrs. R. E. Docwra, Upper Brighton Road, Surbiton.

June 26, 1934, Mr. G. W. LEAK, V.M.H., in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To Delphinium 'W. B. Cranfield' for show purposes (votes unanimous), from Messrs. Blackmore and Langdon, Bath. See vol. 59, p. 445.

To Delphinium 'Lilian Bishop' for show purposes (votes unanimous), from F. A. Bishop, Esq., The Glade, Clewer Green, Windsor. See vol. 59, p. 445.

To Delphinium 'Blackbird' for show purposes (votes unanimous), from Chas. F. Hill, Esq., Westover, Harlington Road, Hillingdon. See vol. 59, p. 445.

Selected for Trial at Wisley.

Delphinium 'W. B. Cranfield,' from Messrs. Blackmore & Langdon, Bath.

Delphinium 'Lilian Bishop,' from F. A. Bishop, Esq.

Delphinium 'Blackbird,' from Chas. F. Hill, Esq.

June 29, 1934, at the Delphinium Society's Show, Mrs. H. LINDSAY SMITH in the Chair, and six other members present.

Award Recommended :—

Award of Merit.

To Delphinium 'Wrexham Glory' for show purposes (votes 6 for, 1 against), from Messrs. Baker, Codsall, Wolverhampton. See vol. 59, p. 445.

Selected for trial at Wisley.

Delphinium Belladonna 'Azure Queen,' from Mrs. George P. Wood, Marsden Nursery, Ashted, Surrey.

Delphinium 'Wrexham Glory,' from Messrs. Baker.

Delphinium 'Madame de Pompadour,' from Mr. W. H. Cheney, Llangarron Nurseries, Ross-on-Wye.

July 17, 1934, at Roundhay Show, Leeds, Mr. C. F. LANGDON in the Chair, and five other members present.

Selected for trial at Wisley.

Delphinium seedling, from H. F. Sykes, Esq., Arkenley, Almondbury, Huddersfield.

Other Exhibits.

H. S. Wainwright, Esq., The Drive, Roundhay, Leeds : Seedlings (two).

Rev. R. Pulleine, Ripley Rectory, Harrogate : Seedlings (two).

NARCISSUS AND TULIP COMMITTEE.

February 6, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twelve other members present.

It was resolved that the Secretary convey to Sir John Arkwright the congratulations of the Committee on the honour of Knighthood conferred on him in the New Year's Honours List.

There were no new plants or groups for the Committee's consideration.

February 20, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for Daffodils and Tulips in fibre.

Banksian Medal.

To Messrs. Wakeley Brothers, Bankside, S.E., for Daffodils and Tulips.

Award of Merit.

To *Narcissus* 'Whiteley Gem' as a market variety for forcing (votes 8 for). See vol. 59, p. 486.

Variety Selected for Trial.

Narcissus 'Prelate' (Division 1a), raised and shown by the Hon. Mrs. Petre, Westwick Hall, Westwick, was selected for trial at Kirton as a market variety for cutting from the open and as a variety for garden decoration.

March 6, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. J. R. Pearson, for Daffodils in bowls.

Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for Tulips and Daffodils in bowls.

Award of Merit.

To *Narcissus* 'Golden Frilled' as a variety for cultivation in pots, pans or bowls (votes 10 for). The variety was registered in 1928 by Messrs. L. van Leeuwen & Sons who did not know who raised it, and it was shown by Messrs. J. R. Pearson, Lowdham. See vol. 59, p. 486.

March 20, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Gold Medal.

To Mr. J. L. Richardson, Waterford, for Daffodils.

Silver Banksian Medal.

To Mr. R. F. Calvert, Coverack, Cornwall, for Daffodils.

To Messrs. The Donard Nursery Company, Newcastle, co. Down, for Daffodils.

To Mr. Guy L. Wilson, Broughshane, co. Antrim, for Daffodils.

Banksian Medal.

To Messrs. Carter's Tested Seeds, Ltd., Raynes Park, S.W., for Daffodils and Tulips.

Award of Merit.

To *Narcissus* 'Fortune's Beauty' as a variety for cutting (votes 14 for). Shown by Mr. R. F. Calvert, Coverack, Cornwall. See vol. 59, p. 485.

To *Narcissus* 'Forerunner' after trial at Gulval as a market variety for cutting from the open. Sent for trial by Mr. P. Williams, Lanarth, St. Keverne. See vol. 59, p. 485.

To *Narcissus* 'Magnificence' after trial at Gulval as a market variety for cutting from the open. Sent by Major A. A. Dorrien-Smith, Tresco, I. of Scilly. See vol. 59, p. 486.

To *Narcissus* 'Whiteley Gem' after trial at Gulval as a market variety for cutting from the open. See vol. 59, p. 486.

Other Exhibits.

Captain H. G. Hawker, Strode, Ermington, sent examples of three little-known double Daffodils, viz.:—*cernuus plenus*, 'Double Lent Lily' and 'Pencrebar.'

Miss Calley, Burderop Park, Swindon, sent a Poetaz variety of Narcissus for naming which was identified as 'Geranium.'

April 4, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. R. F. Calvert, Coverack, Cornwall, for Daffodils.

Silver Banksian Medal.

To Messrs. Barr, for Daffodils.

Award of Merit.

To *Narcissus* 'Coverack Perfection' as a show flower (votes 9 for). From Mr. R. F. Calvert, Coverack, Cornwall. See vol. 59, p. 485.

To *Narcissus* 'Brunswick' as a show flower (votes 7 for). From Messrs. Barr, Covent Garden, W.C. 2. See vol. 59, p. 485.

April 10, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Gold Medal.

To Mr. J. L. Richardson, Waterford, for Daffodils.

To Messrs. F. Rynveld, Hillegom, Holland, for Daffodils.

Silver-gilt Flora Medal.

To Messrs. Barr, Covent Garden, W.C. 2, for Daffodils.

To Mr. R. F. Calvert, Coverack, Cornwall, for Daffodils.

To Messrs. The Donard Nursery Company, Newcastle, co. Down, for Daffodils.

Silver Flora Medal.

To Mr. Guy L. Wilson, Broughshane, co. Antrim, for Daffodils.

Silver Banksian Medal.

To Messrs. Wakeley Brothers, Bankside, S.E., for Daffodils.

Flora Medal.

To Messrs. The Knaphill Nursery, Woking, for Daffodils.

To Messrs. D. Stewart, Wimborne, for Daffodils.

To Mr. W. A. Watts, St. Asaph, for Daffodils.

Banksian Medal.

To Mr. H. G. Longford, Abingdon, for Daffodils.

To Mr. J. C. Martin, Truro, for Daffodils.

Variety Selected for Trial.

Narcissus 'Grackle' (Division 2a), raised by Mr. P. D. Williams and shown by Captain H. G. Hawker, Strode, Ermington, was selected for trial at Kirton as a market variety for cutting from the open.

The Peter Barr Memorial Cup.

It was unanimously recommended that the Peter Barr Memorial Cup, which is awarded annually to someone who has done good work on behalf of the Daffodil, be awarded to Mr. E. A. Bowles.

April 17, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Preliminary Commendation.

To *Narcissus* 'Primrose Glory.' A bicolor trumpet variety (Division 1c) raised and shown by Messrs. R. H. Bath, Ltd., Wisbech.

Gold Medal.

To Mr. J. L. Richardson, Waterford, for Daffodils.

Silver-gilt Banksian Medal.

To Messrs. R. H. Bath, for Daffodils.

To Mr. R. F. Calvert, Coverack, Cornwall, for Daffodils.

To Messrs. L. van Leeuwen, Sassenheim, Holland, for Daffodils.

Silver Flora Medal.

To Messrs. Barr, Covent Garden, W.C. 2, for Daffodils.

Silver Banksian Medal.

To Messrs. Wakeley Brothers, Bankside, S.E., for Daffodils.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE. xxxi

Flora Medal.

To Messrs. D. Stewart, Wimborne, for Daffodils.

Banksian Medal.

To Messrs. Dobbie, Edinburgh, for Daffodils.

Variety Selected for Trial.

Narcissus 'The Marquis' (Division 1a), raised and shown by Messrs. R. H. Bath, Ltd., was selected for trial at Kirton as a variety for garden decoration and as a market variety for cutting from the open.

May 8, 1934, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Barr, Covent Garden, W.C. 2, for Tulips.

To Messrs. Sutton, Reading, for Tulips.

Silver Flora Medal.

To Messrs. Dobbie, Edinburgh, for Tulips.

To Messrs. F. Rynveld, Hillegom, Holland, for Tulips.

Silver Banksian Medal.

To Mr. A. K. Watson, Upton, Norfolk, for Daffodils.

Banksian Medal.

To Mr. Peter Lower, Harpenden, for Daffodils.

To Messrs. M. E. & A. Robinson, Bawtry, for Daffodils.

To Messrs. Wakeley Brothers, Bankside, S.E., for Tulips and Daffodils.

The following awards were recommended after trial at Kirton :—

Award of Merit.

To *Narcissus* 'Glorious' as a variety for garden decoration and as a market variety for cutting from the open. Sent by Mr. J. L. Richardson, Waterford See vol. 59, p. 486.

To *Narcissus* 'St. Agnes' as a market variety for cutting from the open. Sent by Mr. P. D. Williams, Lanarth, St. Keverne. See vol. 59, p. 485.

To *Narcissus* 'Garibaldi' as a variety for garden decoration. Sent by Messrs. J. R. Pearson, Lowdham. See vol. 59, p. 486.

To *Narcissus* 'Quiljon' as a variety for garden decoration. Sent by Mr. E. H. C. Thurston, Chandler's Ford. See vol. 59, p. 486.

May 29, 1934, at Chelsea Show. Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and fifteen other members present.

There were no plants submitted for certificate or groups for the Committee's inspection.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.

April 12, 1934, Mr. J. M. BRIDGEFORD in the Chair, and nine other members present.

Award Recommended :—

To Carnation 'Charming' for exhibition and market, from Messrs. Allwood Bros., Haywards Heath, Sussex. See vol. 59, p. 444.

Other Exhibits.

E. Martin Smith, Esq., Hitchin, Herts : Carnation 'Glen.'

Mrs. S. A. Toon, East Shilton : Carnation 'S. A. Toon.'

Messrs. C. Engelmann, Saffron Walden : Carnations 'Sunshine' and 'Thora.'

May 29, 1934, at Chelsea Show, Mr. J. M. BRIDGEFORD in the Chair, and five other members present.

Award Recommended :—

To Carnation 'Allwood's Purity' for exhibition and market, from Messrs. Allwood Bros., Haywards Heath, Sussex. See vol. 59, p. 444.

Other Exhibit.

Messrs. C. Engelmann, Saffron Walden : Carnation 'Sunshine.'

September 19, 1934, Mr. E. CARTER in the Chair, and five other members present.

Exhibit.

Carnation 'Pink Pelargonium,' shown by Messrs. Allwood Bros., Haywards Heath, Sussex.

JOINT IRIS COMMITTEE.

May 8, 1934, Major F. C. STERN, O.B.E., in the Chair, and nine other members present.

Award Recommended :—

To *Iris japonica*, *Ledger's variety*, for general garden use, from Major F. C. Stern, O.B.E., Highdown, Goring-by-Sea. See vol. 59, p. 446.

Other Exhibits.

F. C. Stern, Esq., F.L.S. : *Iris Grant Duffii* var. *Aitchinsonii*; *Iris stolonifera*; *Iris 'Psyche'*; *Iris Hoogiana*; *Iris 'Parthenope'*; *Iris sofanara*; *Iris Helenae*; *Iris Barnumae*; *Iris urmiensis*; *Iris nigricans*.

G. P. Baker, Esq., V.M.H., Sevenoaks : *Iris unguicularis*.

Colonel C. H. Grey, Cranbrook : *Iris 'Clotho'*; *Iris 'Lucia.'*

May 29, 1934, at Chelsea Show, Mr. E. A. BOWLES, V.M.H., in the Chair, and sixteen other members present.

Selected for trial at Wisley.

Iris 'Porrima,' from Messrs. G. Bunyard, Maidstone.

Iris 'Ma Belle,' from F. Burton, Esq., Hildenborough.

Other Exhibits.

C. W. Christie-Miller, Esq., Henley-on-Thames : *Iris tectorum*.

Messrs. G. Bunyard, Maidstone : *Iris* seedling.

F. W. Tomalin, Esq., Hampton, Middlesex : *Irises 'Hunter's Moon,' 'Monawai,' 'Mabel Goodhew.'*

H. Chadburn, Esq., Saxmundham : *Iris 'Golden Hind.'*

Miss L. F. Pesel, Winchester : *Iris 'Winton Purple.'*

F. C. Stern, Esq., F.L.S. : *Iris 'Joanna.'*

F. Burton, Esq., Hildenborough : *Irises 'Evening Primrose,' 'May Morn,' 'Chrysoberyl.'*

June 7, 1934, Iris Society's Show, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and ten other members present.

Selected for trial at Wisley.

Iris 'Maid of Kent,' from G. P. Baker, Esq., Sevenoaks, Kent.

Iris 'Golden Arrow,' from Rev. Rollo Meyer, Watton-at-Stone, Hertford.

Irises 'Rhodesia,' 'Natal' from G. L. Pilkington, Esq., Woolton, Liverpool.

Irises 'Windsor Lad,' 'Violet Insole,' from Mrs. Insole, The Court, Llandaff.

Iris 'Mab Chadburn,' from H. Chadburn, Esq., Saxmundham, Suffolk.

Iris 'Debonair,' from G. Yeld, Esq., V.M.H., Gerrard's Cross, Bucks.

June 19, 1934, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eleven other members present.

Selected for trial at Wisley.

Iris seedlings 'M.10.C,' 'M.10.D,' 'M.10.E.'; *Iris 'Destiny,'* from G. L. Pilkington, Esq., Woolton, Liverpool.

Other Exhibits.

F. C. Stern, Esq., F.L.S. : *Iris spuria* var. *lilacina*.

G. Yeld, Esq., V.M.H., Gerrard's Cross : *Iris 'Deerfold'; Iris sibirica* seedling.

The awards recommended to the Irises in the Wisley trials were confirmed.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

SUBSCRIPTIONS.

Subscriptions become due on January 1. Fellows who have not yet paid their subscriptions are reminded that one of the privileges of Fellowship ceases on March 15, the last day for receiving applications for surplus plants and seeds.

COMMITTEES.

The attention of Fellows who are desirous of bringing or sending plants and objects of interest to the Society, is directed to the January number of the JOURNAL wherein will be found a list of the Committees and the times at which they meet. A copy of the full regulations for submitting plants, etc., and for exhibiting will be sent on application to the Secretary.

CHELSEA SHOW.

The Show will be held on May 22, 23 and 24, in the grounds of the Royal Hospital, Chelsea, and to mark the occasion of the twenty-fifth anniversary of His Majesty's Accession, a special trophy is offered for the best exhibit shown by an amateur, this trophy being in addition to the Cain Cup. The trophy will be accompanied by a prize of £20 for the exhibitor's gardener.

It is probable that on this occasion there will be a large influx of visitors from the Dominions and from other countries overseas. It is understood that the American Garden Clubs and the Horticultural Society of Lombardy, Italy, are organizing a special visit to England this year.

CONFERENCES.

Conference on Daffodils.

The annual Daffodil Show will take place in the New Hall on Tuesday and Wednesday, April 16 and 17, and on the same days there will be a Fortnightly Show for other flowers in season in the Old Hall. On Tuesday, Wednesday and Thursday, April 16, 17 and 18, there will be a Conference on Daffodils in the New Hall. Important subjects will be introduced for discussion by some of the foremost authorities on Daffodils, and the programme has been arranged so as to allow of free exchange of experiences and views.

It is hoped that the Conference will do much to increase the common stock of knowledge regarding these popular spring flowers and to extend the cultivation of the best modern varieties, especially those adapted for garden decoration and for cutting. The Council, therefore, cordially invite all who are interested in Daffodils to attend and take part in the discussions. Those who intend to be present are requested to notify the Secretary by April 1, so that adequate arrangements may be made. The text of the papers to be given will be available to those who notify their intention of taking part in the discussion beforehand.

A special meeting open to all interested in Daffodils has been fixed for March 19: for particulars see Calendar (p. xxxv).

XXXIV PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Programme of Conference.

TUESDAY, APRIL 16, AFTERNOON AT 3.30.

- (i) Opening address by the Lord ABERCONWAY, C.B.E., V.M.H., President of the Royal Horticultural Society.
- (ii) British Daffodils—past and present. Mr. P. D. WILLIAMS, V.M.H.

WEDNESDAY, APRIL 17, MORNING AT 10.30.

- (iii) Narcissus species. Mr. E. A. BOWLES, M.A., F.L.S., V.M.H.
- (iv) The Daffodil trials.
 - (a) General Survey. Mr. F. J. CHITTENDEN, F.L.S., V.M.H.
 - (b) The Wisley trials. Mr. F. C. BROWN.
 - (c) The Kirton trials. Mr. J. C. WALLACE.
 - (d) The Gulval trials. Mr. H. W. ABBISS, N.D.H.

WEDNESDAY, APRIL 17, AFTERNOON AT 2.30.

- (v) The preparation of Daffodils for forcing. Prof. Dr. E. VAN SLOGTEREN.
- (vi) The breeding of Daffodils. Mr. GUY L. WILSON.

THURSDAY, APRIL 18, MORNING AT 10.30.

- (vii) The commercial cultivation of Daffodils.
 - (a) For flower production. Mr. G. W. LEAK, V.M.H.
 - (b) For bulb production. Mr. A. W. WHITE.
- (viii) Diseases and pests of the Daffodil; their detection and control. Mr. F. A. SECRETT, F.L.S.

Excursions in connexion with the Conference.

On the afternoon of Thursday, April 18, there will be an excursion to the Society's Gardens, Wisley, and to Mr. F. A. Secrett's flower farm at Walton-on-Thames.

On Friday, April 19, there will be an excursion to the bulb-fields at Spalding, Lincolnshire, and visitors will have an opportunity of seeing the Spalding Daffodil Show which opens that day.

Programmes giving the arrangements for these two excursions will be sent to all who intimate their intention of attending the Conference.

A Daffodil Show is to be held at Heemstede, Holland, from April 12 to April 22 as part of the Heemstede International Flower Show (March 15 to May 20). Particulars of the travel facilities available for those who wish to visit the Show may be had from Messrs. Thomas Cook & Son, Ltd., Berkeley Street, W. 1.

Conference on Cherries and Soft Fruits.

The Cherry and Soft Fruit Conference to be held on July 16 and 17, 1935, is the natural sequence of the Apple and Pear Conference held last autumn at the Crystal Palace. This Conference will be held in the Lecture Room of the New Hall, and on this occasion the Kent Branch of the National Farmers' Union will stage their show of Cherries and Soft Fruits in the Society's Old Hall. The programme of the Conference is now available and will be sent on application.

International Conferences.

Two International Conferences will be held during the autumn of this year: the International Botanical Congress, which takes place on September 2-7, 1935, at Amsterdam, and the International Horticultural Congress on September 16-21, 1935, at Rome. The Secretary will be pleased to hear from Fellows who may like to be furnished with particulars.

Conference on Alpine Plants.

Preparations are being made to hold a Conference on Alpine Plants in May, 1936, in co-operation with the Alpine Garden Society, and a programme is being drafted.

CALENDAR.

March 5, 1 to 7.30 P.M., and March 6, 10 A.M. to 5 P.M.—Fortnightly Meeting and Show. On this occasion rock plants from the Alpine house; Daffodils; early-flowering shrubs; Orchids, especially Cymbidiums, and greenhouse plants; perhaps Cinerarias and Hippeastrums, will be shown.

In the afternoon of Tuesday, March 5, at 3.30 P.M., a lecture will be given by Mr. E. R. LUCKHURST in the Lecture Room of the New Hall on "The Small Greenhouse and its Plants."

March 19, 1 to 7.30 P.M., and March 20, 10 A.M. to 5 P.M.—Fortnightly Meeting and Show. Perhaps the only difference between the shows at this time of the year is with the advance of the season, as the number of plants available increases. Competition for the Sewell Medals for Alpine plants takes place on March 19. For particulars apply to the Secretary.

In the afternoon of Tuesday, March 19, at 3.30 P.M., a lecture will be given by Dr. ROGER-SMITH in the Lecture Room of the New Hall on "New Alpines."

Which are the earliest Daffodils? At 4.30 P.M. on Tuesday, March 19, there will be a meeting of Daffodil lovers in the Restaurant of the Old Hall in Vincent Square. The first half-hour will be used for tea and talk (tea will be served from a buffet at 1s. a head), and at 5 P.M. Mr. GUY L. WILSON will open a Discussion on "The Earliest Daffodils." All interested in Daffodils are invited to attend and take part in the Discussion.

April 2, 1 to 7.30 P.M., and April 3, 10 A.M. to 5 P.M.—Fortnightly Meeting and Show. On this occasion rock plants are likely to preponderate, as in the Old Hall the Alpine Garden Society will be holding the first of its shows for the year. Fellows' tickets will admit to this show.

In the New Hall the usual mixed Show will be held, and shrubs in flower, Daffodils and Tulips will be prominent features.

In the afternoon of Tuesday, April 2, at 3.30 P.M., a lecture will be given by Professor T. BARNARD in the Lecture Room of the New Hall on "Cape Bulbs."

April 6, 1 to 7 P.M.—The London Gardens Society holds an Exhibition of Spring Flowers in the Old Hall, to which Fellows' tickets admit.

April 9, 1 to 7.30 P.M., and April 10, 10 A.M. to 5 P.M.—The British Carnation Society's Show is held in the Old Hall. Fellows' tickets admit.

April 16 and 17.—Daffodil Show and Conference. For particulars of Conference see above, and for Show see special Schedule. A show of general interest will also be held on these days.

April 24 and 25.—Fortnightly Meeting and Show, and Early Market Produce Show, occupying both Halls.

The Early Market Produce Show is the one of greatest interest. This is the fourth of such shows organized by the Society to direct attention to the development of the home production of flowers, fruits and vegetables. Each successive year has shown a marked improvement both in variety and quality, and there is no reason to doubt that this year the interest in the show will not only be maintained, but even increased.

In the afternoon of Wednesday, April 24, there will be a lecture of special interest in connexion with this type of horticulture given by Mr. F. A. SECRETT in the Lecture Room of the New Hall, entitled "Irrigation of Horticultural Crops."

April 30 and May 1.—The Rhododendron Association will hold their annual Show in the New Hall, while in the Old Hall will be held the second Show of the Alpine Garden Society. Fellows' tickets will admit to both.

On Tuesday, April 30, at 3.30 P.M., Sir DANIEL HALL will lecture on "Species Tulips" in the Lecture Room of the New Hall. Special attention is drawn to this lecture in view of the fact that this day is not the occasion of an ordinary fortnightly meeting of the Society. It is hoped that, should the season prove favourable, a number of species of Tulips will be exhibited in the Old Hall.

HORTICULTURAL EXAMINATIONS.

British Floral Art Diploma.

The fifth examination for this Diploma will be in two parts, the written on March 14, the practical in the Society's Halls on March 27 and 28, when candidates will be called upon to make various floral designs.

The designs will be open for inspection by Fellows on the afternoon of Thursday, March 28, from 2 to 5 P.M.

The sixth examination will take place on September 19 (written), and October 2 and 3 (practical), 1935. Full particulars may be had on application to the Secretary.

xxxvi PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

General Examinations in Horticulture, etc.

There has been a marked increase in the numbers entering for all the Society's examinations this year. The examinations are arranged in various places to suit candidates and to take place as follows :

March 25.—General Examination, Seniors and Juniors.

„ 30.—Teachers' Examination in School and Cottage Gardening, Elementary and Advanced (written).

April 27.—National Diploma in Horticulture, Preliminary (written) and Final (written).

Entries for these examinations closed some time ago, but particulars in preparation for 1936 examinations may be had on application to the Secretary.

PUBLICATIONS.

" Apples and Pears: Varieties and Cultivation," the Report of the Apple and Pear Conference at the Crystal Palace, 1934, has now been published, price 7s. 6d. It should prove a useful book to all those interested in the cultivation of these fruits, containing as it does contributions on every aspect of cultivation, pruning, planting, manuring, etc., as well as the best fruits to grow.

R.H.S. Diary.—There are still a few copies of the R.H.S. Diary obtainable on application to the Secretary, price 2s.

HONORARY FELLOWS.

The following well-known botanists and horticulturists have been elected Honorary Fellows of this Society in addition to those whose names appear in this JOURNAL, vol. 60, pp. 10, 11.

Mr. W. J. BEAN, I.S.O., V.M.H., late Curator of the Royal Botanic Gardens, Kew.

Mr. A. D. COTTON, O.B.E., F.L.S., Keeper of the Herbarium and Library at the Royal Botanic Gardens, Kew.

Dr. F. LEMPERG, of Hatzendorf, Austria, Honorary Member of the Alpine Garden Society.

Dr. F. C. E. BOERGESEN, of Universitetets Botaniske Museum, Copenhagen.

Mr. J. M. C. HOOG, of Messrs. C. G. van Tubergen, Ltd., Zwanenburg Nurseries, Haarlem, Holland, who has done notable work for Horticulture by introducing into cultivation many new species of bulbous and tuberous rooted plants, obtained by their collectors in Central Asia and elsewhere.

Prof. F. E. FRIES, Ph.D., F.M.L.S., Professor and Director of Bergianska Trädgården, Stockholm.

Prof. R. H. COMPTON, M.A., F.R.S.S.Af., of the National Botanic Gardens of S. Africa, Kirstenbosch, Cape Town.

Mr. C. C. CALDER, B.Sc., F.L.S., Director, Botanical Survey of India, Calcutta.

Dr. E. D. MERRILL, F.M.L.S., Director of the New York Botanical Garden, Bronx Park, New York.

Prof. ALFRED REHDER, A.M., Associate Professor of Dendrology and Curator of the Herbarium, Arnold Arboretum, Harvard University, Jamaica Plain, Massachusetts.

Dr. A. B. SROUT, Director of the Laboratories, New York Botanical Garden, Bronx Park, New York.

WISLEY GARDENS.

Demonstrations in Garden Practice.

On Wednesday afternoon, March 13, and again on Thursday, March 14, a demonstration on Seed Sowing, both indoors and outdoors, will be given from 2 to 4 o'clock on each day in the Society's Gardens at Wisley.

On Wednesday, March 20, and Thursday, March 21, there will be a demonstration on Rose Pruning from 2 to 4 P.M. on each day. Fellows intending to be present on either of these days should notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day, so that adequate provision may be made.

The Garden.

The parts of the Garden likely to be particularly attractive in March or early April are the Alpine House with encrusted Saxifrages, the first of the *Primulas*

and early bulbs, the rock garden and its surroundings, particularly with *Narcissus cyclamineus*, *N. Bulbocodium*, and the early dwarf Rhododendrons, the early-flowering shrubs in the wild garden, the shrub borders, and in Seven Acres, including the winter Heaths, where special attention may be drawn to the deep purple *Erica carnea Vivellii* and the lovely white variety 'Springfield White.' Species of *Prunus* are likely to make a show towards the end of March, and the Forsythias also will be conspicuous.

Many plants will be in flower to follow the Acacias in the temperate house and in the smaller house near the Laboratory, and various forms of *Primula malacoides* on trial in the plant house are likely to be very attractive. This *Primula* commenced to flower in January and is likely to continue for some weeks.

HALL LETTINGS.

The Society's Halls have been let for the following events :

- March 4-9. Old Hall. The All-England Badminton Championships. Particulars may be had from Mr. F. W. HICKSON, 74 The Grange Drive, Winchmore Hill, N. 21.
- March 3. Old Hall. Gas Light and Coke Company are holding an Exhibition of Arts and Crafts, being work done by members of their Company.

In the New Hall, on March 11-15, the Hospitals, Nursing, Midwifery and Public Health Exhibition will be held ; and on March 26-28 the London Master Bakers' Exhibition.

SPECIAL NOTE.

In view of inquiries received and in order to avoid any misunderstanding on the part of the Fellows of the Royal Horticultural Society, the Council of the Society wishes it to be known that the appeal which has been made in connexion with Erlestoke Park, Wiltshire, has not been in any way made with the support or under the auspices of the Society.

GENERAL MEETING.

JANUARY 8, 1935.

Silver-gilt Grenfell Medal.

To Lieut. J. P. W. Furse, R.N., 10 Bramley Flats, Alverstokey, Hants, for Lily paintings.

Silver Grenfell Medal.

To Mr. H. A. Thomerson, St. Margarets, Church Hill, Loughton, Essex, for drawings of shrubs.

Grenfell Medal.

To Miss Winifred Walker, 25 Tanza Road, Hampstead, N.W. 3, for flower paintings.

To Mr. A. H. Powell, 9 Bailey Street, London, W.C., for flower paintings.

To Miss G. Dorrien Smith, Fishbourne House, Wootton Bridge, I.W., for water colour paintings of plants.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and ten other members present.

Change of colour in Lily bulbs.—Dr. Tincker drew attention to the rapid development of a purple coloration in the scales of Lily bulbs after exposure to light.

Salix fragilis.—Mr. Fraser showed a specimen of the staminate catkins of *S. fragilis* from South Merstham, and pointed out that staminate trees of this species are rare in this country. He also showed the pistillate form from Redhill, and a large-leaved form with deep serratures to the foliage and (frequently) branched catkins from Weybridge and Kew.

Gladiolus McKinderi.—A *Gladiolus* with red flowers was shown by Mr. Hay. It was identified as *G. McKinderi*.

Gladiolus maculatus shown by Professor Barnard was referred to the Committee from Floral Committee B. It has rather small dull-coloured flowers.

Sarcococca ruscifolia.—A specimen of *Sarcococca ruscifolia* bearing both ripe fruit and the white scented flowers, was shown by Mr. Chittenden.

Iris sindjarensis was shown from the John Innes Horticultural Institute, and Mr. Bruce Jackson showed

Phyllocladus trichomanoides from Lord Headfort's garden at Kells, co. Meath.

Crocus aureus?—A *Crocus* from Messrs. Barr's stand with yellow flowers, striped on the outside, and a rather small cupped perianth was commented upon by Mr. Bowles, who suggested it as a possible origin of the Dutch yellow *Crocus*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and fifteen other members present.

Exhibits.

Messrs. Cheal, Crawley: collection of Apples.

Messrs. Bunyard, Maidstone: collection of Apples.

Mr. F. Grant, High Park Gardens, Stamford: Apple 'Martin Cecil.'

Mr. E. A. Bunyard, Allington: Apples 'Claygate Pearmain,' 'Orleans Reinette,' 'Bascombe Mystery.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, *Lachenalia Boudis*, etc.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

Banksian Medal.

To Messrs. Toogood, Southampton, for Cyclamen.

To Messrs. Wakeley, London, for Hyacinths.

Other Exhibit.

Messrs. Blackmore & Langdon, Bath: Blue Primroses.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Banksian Medal.

To Messrs. Barr, Covent Garden, for bulbous plants.

To Hocker Edge Gardens, Cranbrook, for bulbous plants.

To Messrs. Stuart Low, Enfield, for Camellias and other shrubs.

Award of Merit.

To *Acacia dealbata* as a tender flowering shrub (votes 14 for), from Mrs. R. L. Newman, Blackpool, Dartmouth. See p. 127.

To *Prunus campanulata* as a flowering shrub for the greenhouse (votes 14 for), from the Director, Royal Botanic Gardens, Kew. See p. 128.

To *Rhododendron mucronulatum* var. *roseum* as a hardy flowering shrub (votes unanimous), from the Director, Royal Botanic Gardens, Kew. See p. 129.

Cultural Commendation.

To Mr. F. Powell, gardener to Iris, Lady Lawrence, Riverdale, Dorking, for a specimen plant of *Agapetes macrantha*. This handsome and uncommon plant is described in the JOURNAL, vol. 57, p. xcix.

Other Exhibits.

T. T. Barnard, Esq., Wareham : *Gladiolus maculatus*.

Messrs. Cheal, Crawley : shrubs and bulbous plants.

A. J. Cobb, Esq., Reading : *Berberis* sp., *Pyracantha angustifolia* var.

T. Hay, Esq., Hyde Park : *Gladiolus* sp.

Miss Hopkins, Coulsdon : hardy plants.

John Innes Hort. Inst., Merton : *Iris sindjarensis*.

Messrs. Neale, Newhaven : succulents.

Mrs. R. L. Newman, Dartmouth : *Raphiolepis* × *Delacourii*.

Major A. Pam, Broxbourne : *Buddleia variabilis* × *B. asiatica*.

Lord Rendlesham, Mawnan : flowering shrubs.

Messrs. Russell, Richmond : flowering shrubs.

Ingham Whitaker, Esq., Lyminster : *Acacia Baileyana*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and fourteen other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for Cyripediums.

To Dr. F. Craven Moore, Duckyls, East Grinstead, for Cyripediums.

Silver-gilt Banksian Medal.

To Clive Cookson, Esq., Nether Warden, Hexham, for a group.

To Messrs. H. G. Alexander, Tetbury, for Cyripediums.

Silver Banksian Medal.

To Sir Jeremiah Colman, Bt., Gatton Park, Reigate, for a group.

To Messrs. Sanders, St. Albans, for a group.

To Messrs. Charlesworth, Haywards Heath, for a group.

To G. P. Harben, Esq., Kings Somborne, for Cyripediums.

To Messrs. Black & Flory, Slough, for a group.

Banksian Medal.

To Messrs. A. J. Keeling, Bradford, for Cyripediums.

To Messrs. Stuart Low, Jarvis Brook, for a group.

To Mr. D. A. Cowan, Surbiton, for Cyripediums.

To F. J. Hanbury, Esq., East Grinstead, for a group.

To Messrs. J. & A. McBean, Cooksbridge, for a group.

To Messrs. Harry Dixon, Wandsworth Common, for a group.

First-class Certificate.

To *Sophrolaeliocattleya* × 'Phena' var. 'Saturn' (*S.-l.-c.* × 'Rainbow' × *S.-l.-c.* × 'Meuse') (votes 13 for, 1 against), from Messrs. McBean, Cooksbridge. See p. 129.

Award of Merit.

To *Odontioda* × 'Dacia' var. 'Solario' (*Oda.* × 'Juno' × *Odm. oximium*) (votes 12 for), from N. Prinsep, Esq., The Boxes, Pevensey Bay, Sussex. See p. 128.

To *Odontoglossum* × 'Yolandum' var. 'Princess' ('Princess Yolande' × *crispum*) (votes 13 for), from Messrs. Charlesworth. See p. 128.

To *Calanthe* × 'Warden' var. 'Ruby' ('Hexham Gem' × 'Angela') (votes 12 for), from Clive Cookson, Esq. See p. 127.

Cultural Commendation.

To Mr. E. V. Kent (Orchid grower to E. R. Ashton, Esq., Tunbridge Wells), for *Lycaste* × *Balliae*, with many flowers.

Other Exhibits.

F. H. Hanbury, Esq., East Grinstead : *Odontioda* × 'Japetus.'

G. P. Harben, Esq., Kings Somborne : *Cypripedium* × 'Cromwell.'

GENERAL MEETING.

JANUARY 22, 1935.

Silver Grenfell Medal.

Lieut. J. P. W. Furse, 10 Bramley Flats, Alverstoke, for an exhibit of Lily paintings.

A lecture was given by Mr. J. T. WALL on "The Alpine House at Wisley" (p. 99).

Chairman, Mr. MARK FENWICK, J.P.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eight other members present.

Crocus *sp.*—Mr. Bowles reported that he had not been able to come to a definite conclusion with regard to the *Crocus* taken by him at the last meeting, but it proved to be near *Crocus Suterianus*, differing in the proper spathe being monophyllous instead of diphyllous and in some other points (p. xxxviii).

Phylloxera *on vine.*—Mr. G. F. Wilson showed specimens of vine roots recently discovered in a greenhouse in Berkshire attacked by the vine *Phylloxera*, together with photographs of the insect. This insect has not been found for many years in this country, and in order to prevent its spread the drastic measures necessary are being carried out.

Rooting of Lilies.—Dr. Tincker showed photographs of *Lilium speciosum* to illustrate the result of addition of granulated charcoal to a clay soil in the growth of roots. The bulb roots were of about the same size and development, but the stem roots were markedly better in development in the soil containing charcoal. He considered the result due to better aeration in that soil.

Plants from Abyssinia.—Dried specimens of two plants, apparently species of *Plectranthus*, were shown, one with red, the other with blue flowers. They were collected by Captain Erskine on red volcanic soil devoid of lime at an altitude of 6,000 ft., where the rainfall is 85 inches and frost is unknown.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and fifteen other members present.

Award Recommended :—

Silver Knightian Medal.

To Messrs. Sutton, Reading, for collection of vegetables.

Other Exhibits.

Mr. C. J. Howlett, Easley : Apple 'Strawberry Pippin.'

Mr. S. Lockyear, Exeter : Seedling Apple.

Mr. E. A. Bunyard, Allington : Apples 'Red Gravenstein,' 'Pine Apple Russet.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Blackmore & Langdon, Bath, for Cyclamen.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Toogood, Southampton, for *Primula obconica*.

Flora Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, *Lachenalia Boudii*, etc.

Banksian Medal.

To Ashington (Sussex) Nurseries, Ashington, for Carnations.

To Messrs. S. Low, Enfield, for Carnations and other greenhouse plants.

To Messrs. Wakeley, London, for Hyacinths.

Selected for trial at Wisley.

Primula malacoides 'Duchess of Kent,' from Messrs. Carters Tested Seeds, Raynes Park.

Other Exhibit.

Messrs. Woolman, Leicester : Chrysanthemum 'Pink Elegance.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Flora Medal.

To Hocker Edge Gardens, Cranbrook, for bulbous plants.

Banksian Medal.

To Messrs. Barr, Covent Garden, for bulbous plants.

To Messrs. Russell, Richmond, for flowering shrubs.

To Messrs. Stewart, Ferndown, for rock plants and shrubs.

To Messrs. Waterer, Sons & Crisp, Twyford, for bulbous and rock plants.

Other Exhibits.

Mrs. Gwendolyn Anley, Woking : *Cotoneaster rubens*.

University Botanic Gardens, Cambridge : *Prunus cantabrigiensis*.

Messrs. J. Cheal, Crawley : shrubs and rock plants.

W. Balfour Gourlay, Esq., Cambridge : *Cyclamen ibericum*.

Lt.-Col. C. H. Grey, D.S.O., Cranbrook : *Cyclamen libanoticum*, *Galanthus nivalis Atkinsii*.

Edward Howarth, Esq., C.B., Kirdford : *Sycopsis sinensis*.

Iris Lady Lawrence, Dorking : *Prinsepia sinensis*.

Lady Leconfield, Petworth : *Aucuba japonica longifolia*, *A. japonica maculata*.

The Rev. Canon H. Rollo Meyer, Hertford : bulbous Irises.

Messrs. Prichard, Christchurch : *Megasea ligulata*, Froud's variety.

Major F. C. Stern, Goring-by-Sea : *Arbutus hybrida*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.

To Messrs. Charlesworth, Haywards Heath, for a group.

Other Exhibits.

Messrs. Harry Dixon, Wandsworth Common : a group.

Messrs. Black & Flory, Slough : a group.

Messrs. Stuart Low, Jarvis Brook : a group.

Messrs. H. G. Alexander, Tetbury : a group.

Messrs. Sanders, St. Albans : a group.

Messrs. McBean : a group.

N. Prinsep, Esq., Pevensey Bay, Sussex : *Cypripedium* × 'Chloristopher' var. 'Monarch.'

F. J. Hanbury, Esq., East Grinstead : *Odontoglossum* × 'Eudora' var. 'Perfection.'

GENERAL MEETING.

FEBRUARY 5, 1935.

Silver-gilt Grenfell Medal.

To Lady Beatrix Stanley, C.B.E., C.I., Sibbertoft Manor, Market Harborough, for an exhibit of paintings of wild and cultivated plants of India.

To Mrs. V. Higgins, 28 Northampton Road, Croydon, Surrey, for an exhibit of water-colour drawings of Cacti and Succulents.

Grenfell Medal.

To Miss M. I. Greenfield, 1 Lyoth Villas, Lindfield, Sussex, for an exhibit of paintings of Orchids.

A lecture was given by Mr. A. PAYNE on "The Cultivation of Salad Vegetables in the Private Garden."

Chairman, Mr. W. F. GILES.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

The Committee heard with sorrow of the death of Mr. John Fraser on January 24, 1935, following an accident, and desired the Secretary to convey to his brother at Fraserburgh a message of sympathy and appreciation of Mr. Fraser's great services to the Committee and horticulture generally.

Prunus for identification.—A *Prunus* from Lady Lawrence with pink flowers was identified as *Prunus mume plena*.

Plants from Abyssinia.—Mr. Cotton reported that the two plants from Abyssinia had been identified as *Coleus Auranti* and *C. latifolia*.

Fasciated Snowdrop.—Mr. Bowles showed *Galanthus byzantinus* with two flowers on a stalk, arising from fasciation.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twelve other members present.

Awards Recommended :—

Award of Merit.

To Apple 'Winter King,' from Messrs. Pope, Barkham, Wokingham. See p. 127.

This variety was also recommended for inclusion in the Commercial Fruit Trials at Wisley.

Other Exhibits.

Mr. H. E. Pearce, Chesham : Seedling Apple.

Mr. E. A. Bunyard, Allington : Apples 'Rouge du Lac' and 'Wanstall Pippin.'

Samples of fruit from the exhibit of South African Fruits in season, staged by the Imperial Fruit Show, Ltd., were before the Committee.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs Bath, Wisbech, for Daffodils, Tulips, Hyacinths.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for Cyclamens and Blue Primroses.

To Messrs. Engelmann, Saffron Walden, for Carnations, *Euphorbia fulgens*, etc.

Banksian Medal.

To Messrs. Carters Tested Seeds, Raynes Park, for *Primula malacoides*.

To Messrs. S. Low, Enfield, for Carnations.

To Messrs. Wakeley, London, for Hyacinths, Daffodils, etc.

Selected for trial at Wisley.

Primula malacoides 'Exquisite,' from Mr. W. F. Baker, Cromer.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Silver Banksian Medal.

To Hocker Edge Gardens, Cranbrook, for bulbous plants in pans.

Flora Medal.

To Messrs. Russell, Richmond, for forced shrubs.

Banksian Medal.

To Messrs. Barr, Covent Garden, for Narcissi and other bulbous plants.

To Messrs. Cheal, Crawley, for bulbous and alpine plants.

To Messrs. Stuart Low, Enfield, for Epacris and Camellias.

To Messrs. Neale, Newhaven, for succulents.

To Messrs. Pritchard, Christchurch, for Ericas and alpine plants.

To Messrs. Stewart, Ferndown, for bulbous plants and shrubs.

To Messrs. Waterer, Twyford, for bulbous and alpine plants.

Award of Merit.

To *Cotoneaster lactea* as a hardy, ornamental-fruited shrub (votes 16 for), from the Marquess of Headfort; Kells, co. Meath. See p. 127.

Other Exhibits.

Alpine Nurseries, West Moors : alpine and bulbous plants.

Dartington Hall, Ltd., Totnes : shrubs and alpine plants.

Miss P. Dimsdale, Lechlade : *Cyclamen repandum*.

W. Balfour Gourlay, Esq., Cambridge : *Fritillaria Sibthorpiana*.

Miss Hopkins, Coulsdon : hardy plants.

Collingwood Ingram, Esq., Benenden : *Prunus mandschurica*.

Mr. J. Klinkert, Richmond : clipped trees.

Iris Lady Lawrence, Dorking : *Prinsepia sinensis*, *Prunus mume*.

Mrs. H. Milford, Chedworth : alpine plants.

Messrs. Simmonds, King's Langley : *Cotoneaster hybrida pendula*.

F. J. Strover, Esq., S. Norwood : *Billbergia nutans*.

His Grace the Duke of Bedford, Woburn Abbey : *Berberis pruinosa*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To T. O. Stevens Perry, Esq., West Byfleet, Surrey, for *Cypripediums*.

Award of Merit.

To *Cymbidium* × 'Cresta' (*grandiflorum* × 'Flamingo') (votes unanimous), from Lionel de Rothschild, Esq., Exbury, Southampton. See p. 127.

To *Cymbidium* × 'Claudette' (*Coningsbyanum* × 'Miranda') (votes 12 for, 4 against), from Messrs. McBean, Cooksbridge. See p. 127.

Other Exhibits.

Messrs. Sanders, St. Albans : a group.

Messrs. Charlesworth, Haywards Heath : a group.

Messrs. McBean : a group.

Messrs. Stuart Low, Jarvis Brook : a group.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

Messrs. H. G. Alexander, Tetbury : a group.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and nine other members present.

Plant to be seen again.—The Committee desired to see again a hybrid between *Narcissus triandrus albus* and *N. Bulbocodium*, shown by Miss P. Dimsdale, Lechlade.

JOINT DAHLIA COMMITTEE.

August 14, 1934, Mr. T. HAY, V.M.H., in the Chair, and eight other members present.

Selected for trial at Wisley.

From Mr. J. F. Barwise, Burnley : ' Hodder ' (Small Dec.), ' Ribble ' (Med. Dec.), ' Towneley Favourite ' (Small Dec.).

From Messrs. Stredwick, St. Leonards-on-Sea : ' Corncrake ' (Cactus), ' Music ' (Small Dec.), ' Titbit ' (Small Dec.).

August 28, 1934, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eight other members present.

Selected for trial at Wisley.

From Messrs. Ballego, Leiden, Holland : ' Ballego's Surprise.'

From Messrs. Brown & Such, Maidenhead : ' Babs ' (Pompon).

From Mr. G. Elsom, Spalding : ' R. W. Hastings.'

From Messrs. Stredwick, St. Leonards-on-Sea : ' Anna Flemming ' (Large Dec.), ' A. T. Simmonds ' (Large Dec.), ' Duplex ' (Double Colletette), ' Enid Crane ' (Large Dec.), ' Honeybird ' (Small Cactus), ' Miss Anstey ' (Large Dec.), ' Poppy ' (Small Dec.).

From Messrs. Treseder, Cardiff : ' Cardiff Beauty ' (Small Dec.), ' Derby Gem ' (Dec.).

Dahlias were also submitted by A. J. Cobb, Esq., Reading ; Mr. P. Ladds, Swanley Junction ; S. P. Roddon, Esq., Tunbridge Wells ; J. S. Wallis, Esq., Heston.

September 4, 1934, Mr. D. B. CRANE, in the Chair, and seven other members present.

Selected for trial at Wisley.

From Messrs. Ballego, Leiden, Holland : ' Inspiration ' (Cactus), ' White Abundance ' (Large Dec.).

From Messrs. Brown & Such, Maidenhead : ' The Icicle ' (Cactus).

From Messrs. Burrell, Cambridge : ' Barwell ' (Small Dec.), ' Pandora ' (Semi-Cactus).

From Messrs. Carlée, Haarlem, Holland : ' Alois Neelen ' (Semi-Cactus), ' Flora ' (Semi-Cactus), ' Yoger ' (Semi-Cactus).

From Messrs. Cheal, Crawley : ' Dainty ' (Pompon), ' Oberon ' (Pompon).

From Messrs. Maarsen, Aalsmeer, Holland : ' Maarsen's Favourite ' (Semi-Cactus).

From Messrs. Rutter, Heswall : ' Pride of Oldfield ' (Small Dec.).

From Messrs. Stredwick, St. Leonards-on-Sea : ' Miss Wilson.'

From Messrs. Topsvoort, Aalsmeer, Holland : ' André Csizik ' (Semi-Cactus), ' Wepezo ' (Semi-Cactus).

From Mr. J. T. West, Brentwood : ' Acme,' ' Endeavour ' (Min. Cactus), ' Joy ' (Min. Cactus), ' Lovegold ' (Min. fld. Pæony), ' Marina ' (Min. Cactus), ' Pixie,' ' Toddler ' (Small Dec.).

Dahlias were also submitted by Messrs. Bruidegom, Baarn, Holland ; Mr. C. W. Danghtry, Chichester ; Mr. R. T. Halliday, Lanark ; Mr. C. Hilderley, Windsor ; Mr. C. Kroon, Baarn, Holland ; Miss G. Miller, Hitchin ; Mrs. Courtney Page, Haywards Heath ; Rev. W. Shirley, Oxford.

September 11, 1934, Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eight other members present.

Selected for trial at Wisley.

From Mr. J. T. West, Brentwood : ' Apollo,' ' Baby Dot,' ' Billy Clark,' ' Elf,' ' Porcupine.'

From Messrs. Stredwick, St. Leonards-on-Sea : ' Endeavour ' (Cactus), ' Faith ' (Small Dec.), ' Miss Knighton ' (Large Dec.) ' Morocco ' (Small Dec.), ' Petunia ' (Cactus), ' Sudan ' (Large Dec.).

Dahlias were also submitted by H. B. Baker, Esq., Stoke Newington ; Mrs. R. Bigg, Horsham ; Messrs. Cheal, Crawley ; Felixstowe Urban District Council ; Miss G. Miller, Hitchin ; Stirling Stent, Esq., Havant ; Miss I. Wood, Haywards Heath.

September 19, 1934, Major G. CHURCHER in the Chair, and seven other members present.

Selected for trial at Wisley.

From Messrs. Burrell, Cambridge : ' Belinda ' (Small Dec.), ' Frolic ' (Charm), ' Leita ' (Small Dec.).

From Messrs. Stredwick, St. Leonards-on-Sea : ' Wilfred Taylor ' (Large Dec.).

From Mr. J. T. West, Brentwood : ' Jennie ' (Small Dec.), ' Luna,' ' Twilight.'

Dahlias were also submitted by Mr. A. J. Cobb, Reading ; Mr. J. S. Wallis, Histon.

October 9, 1934. Mr. T. HAY, M.V.O., V.M.H., in the Chair, and ten other members present.

Selected for trial at Wisley.

From Messrs. Burrell, Cambridge : ' Lala ' (Charm).

From Messrs. Cheal, Crawley : ' Bromley Star ' (Star), ' Lady Madge ' (Small Pæony), ' Roma ' (Mignon).

From Mr. S. Ogg, Swanley : ' Lemon Beauty ' (Charm), ' Mabel Morgan,' ' Pinkie ' (Charm), ' Sarah Peach.'

From Mr. J. T. West, Brentwood : ' Mrs. Swanson ' (Garden Cactus).

Dahlias were also submitted by the following : A. J. Cobb, Esq., Reading ; T. Greville Fulkes, Esq., Burstow ; H. R. Gibbens, Esq., Coventry ; Messrs. Stredwick, St. Leonards-on-Sea ; G. M. Turner, Esq., Hemel Hempstead.

BOOKS ADDED TO LIBRARY, 1934.

(Cont. from Vol. 59, p. ccxii.)

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- Michurin, I. V. V'ivedenie nov'ikh uluchshenn'ikh sortov plodov'ikh i yaghdn'ikh rastenii. [Production of new and improved kinds of fruit and berry-bearing plants.] Col. pls. Illus. 8vo. Selchoegie, 1933.
- Millard, Walter Samuel. See BLATTER, E. Beautiful Indian trees.
- Mitchell, Sir Thomas Livingstone. Three expeditions into the interior of eastern Australia; with descriptions of the recently explored region of Australia Felix and of the present colony of New South Wales. 2nd ed. 2 vols. Illus. Map. 8vo. 1839. (2)
- Morton, J. W. Fruit and vegetable growing for canning. 8vo. 1933. (1)
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- Murbeck, Svante. Monographie der Gattung *Verbascum*. (Lunds Univ. Arssk., Av. 2, xxix. 2.) Illus. 8vo. Lund, 1934. (7)
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- Paris. Muséum National d'Histoire Naturelle. Herbar du Muséum: Phanérogamie. Notulae systematicae. Publiées par HENRI LECOMTE. Vols. 1-4, no. 5. Illus. 8vo. Paris, 1909-28. (2)
- Parmentier, Paul. Contribution à l'étude du genre *Pulmonaria*. (Mém. Soc. Emulat. Doubs.) 4to. Besançon, 1891 [Typescript].
- Peace, T. R. See DAY, W. R. Experimental production and diagnosis of frost injury.
- Poelnitz, Karl von. Die Aufteilung der Gattung *Mesembryanthemum* L. (Fedde: Rep. Sp. Nov., xxxii.) 8vo. Berlin, 1933. (2)
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- Rohde, Eleanor Sinclair. Gardens of delight. Illus. 8vo. 1934. (1)
- Rouy, Georges. Icones plantarum Galliae rariorum. Atlas iconographique des plantes rares de France et de Corse. Fasc. 1 (all issued). Illus. 4to. Asnières & Paris, 1897. (2)
- Salisbury, Frederick Simpson. Rambles in the Vaudese Alps. Illus. 8vo. 1916. (3)
- Sander & Sons. Addenda to SANDER'S List of *Orchid hybrids*, 1931-33. 8vo. St. Albans, [1934]. (3)
- Sargent, Charles Sprague. Introduction. See DES CARS, A. J. Treatise on pruning.
- Schlechter, Rudolf. Die Orchidaceen von Deutsch-Neu-Guinea. (Fedde: Rep. Sp. Nov. Beihefte, i.) 8vo. Berlin, 1914. (1)
- Figuren-Atlas zu den Orchidaceen von Deutsch-Neu-Guinea. (Fedde: Rep. Sp. Nov. Beihefte, xxi.) Illus. 8vo. Berlin, 1923-28. (2)
- Die Orchideenfloren der südamerikanischen Kordillerenstaaten: I. Venezuela, II. Colombia, III. Ecuador, IV. Peru, V. Bolivia. (Fedde: Rep. Sp. Nov. Beihefte, vi-x.) 8vo. Berlin, 1919-1922. (2)
- Schlechter, Rudolf. Figuren-Atlas zu den Orchideenflora der südamerikanischen Kordillerenstaaten. Herausgegeben von R. MANSFELD. (Fedde: Rep. Sp. Nov. Beihefte, lvii.) Illus. 8vo. Berlin, 1929. (2)

- Schneider, Camillo Karl.** See SILVA TAROUCA, E. Unsere Freiland-Stauden . . . 5th ed.
- Schousboe, Peder Kofod Anker.** Beobachtungen über das Gewachsreich in Marokko gesammelt auf einer Reise in den Jahren 179[1]-93. Theil 1. Aus dem Dänischen übersetzt von JOHANNES AMBROSIIUS MARKUSSEN. Illus. 8vo. Copenhagen & Leipzig, 1801. (2)
- Schröter, Carl.** Ueber die Vielgestaltigkeit der Fichte (*Picea excelsa* Link). (Viertelj. Naturf. Ges. Zürich, xliii.) Illus. 8vo. Zürich, 1898. (3)
- Uebersicht über die Modifikationen der Fichte. Uebersicht über die Mutationen der Fichte nach Wuchs und Rinde. (Schweiz. Zeitschr. Forstwesen.) Illus. 8vo. [Berne], 1934. (3)
- Showalter, William Joseph, & others.** The book of wild flowers. By W. J. SHOWALTER, GILBERT GROSVENOR & E. J. GESKE. With illustrations by MARY E. EATON & E. J. GESKE. 2nd ed. Col. pls. Illus. 8vo. Washington, D.C., 1933. (2)
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- Smith, Kenneth M.** Recent advances in the study of plant viruses. Col. pl. Illus. 8vo. 1933. (1)
- Sorauer, Paul.** Handbuch der Pflanzenkrankheiten. 6th ed. Herausgegeben von O. APPEL. Vol. 1. Die nichtparasitären und Virus-Krankheiten. 2 vols. Illus. 8vo. Berlin, 1933-34. (2)
- Spingarn, J. E.** American *Clematis* for American gardens. A brief account of all species native to the United States. (Nat. Hort. Mag., xiii.) Illus. 8vo. Washington, D.C., 1934. (3)
- Stout, Arlow Burdette.** Daylilies, the wild species and garden clones, both old and new, of the genus *Heemerocallis*. Col. pls. Illus. 8vo. New York, 1934. (1)
- Sudell, Richard.** Landscape gardening. Col. pl. Illus. 8vo. 1933. (1)
- Sweet, Robert.** The hothouse and greenhouse manual, or botanical cultivator. 6th ed. 8vo. 1839. (2)
- Timbal-Lagrave, Édouard Pierre Marguerite.** Essai monographique sur les *Dianthus* des Pyrénées françaises. Avec planches par E. BUCQUOY. (Bull. Soc. Agr. Sci. Litt. Pyrénées-Orientales, xxv.) Illus. 8vo. Perpignan, 1881. (2)
- Turner, Dorothy M.** See BURR, SYDNEY. British economic grasses.
- Tutin, Thomas Gaskell.** See GILMOUR, J. S. L. List.
- Verzascha, Bernhard.** Neu vollkommenes Kräuterbuch von allerhand Gewächsen der Baumen, Stauden und Kräutern die in Teutschland, Italien, Franckreich und in andern Orten der Welt herfür kommen. Illus. fol. Basel, 1678. (2)
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- Warwick, Frances Evelyn, Countess of.** See GREVILLE, FRANCES E.
- Wolf, Theodor.** Monographie der Gattung *Potentilla*. (Bibliotheca Bot., xvi.) Illus. 4to. Stuttgart, 1908. (2)
- Wright, Walter P.** Editorial note. See DUNKIN, H. Pruning.

DONATIONS TO THE SOCIETY'S GARDENS, 1934.

ABERCONWAY, Lord, Bodnant; *Gentiana sino-ornata*, *Primula sonchifolia*, *P. Winterti alba*, *Rhododendron rhabdotum*. ALMA ATA BOTANIC GARDEN, U.S.S.R.; Collection of seeds. APPALACHIAN EXPEDITION; Collection of plants. ARMITAGE, Miss E., per Mr. F. J. CHITTENDEN; Seed of *Iris "caudata."* BAILLIE, Mrs., Nairn; Seed of *Delphinium Welbyi*. BAKER, A., Bromley; Seeds of *Iris*, etc. BAKER, G. P., Sevenoaks; Seeds of Cassaba Melon, *Ranunculus asiaticus* vars.; bulbs of *Galanthus*; collection of plants. BALFOUR, A. P., Slough; Seedlings of *Haplopappus pectinatus*; plant of *Dimorphothecha chrysanthemifolia*. BALLS, E. K., Knebworth; Seed of *Iris* sp., *Hesperis* sp., *Macrotomia cephalotes*, *Orphanidesia gaultherioides*. BALLS' EXPEDITION, per Royal Botanic Garden, Edinburgh; Collection of seeds. BARNHAM NURSERIES, Sussex; Trees of Apple 'Chorister Boy.' BARR & SONS, Covent Garden; Seeds of climbing plants from India. BARRES, DOMAINE DES, Loiret, France; Collection of tree and shrub seeds. BARTHOLOMEW, A. C., Reading; Collection of seeds. BASEL BOTANIC GARDEN; Collection of seeds. BATH, Messrs. R. H., Wisbech; Collection of *Pæonies*, *Phlox*, *Delphiniums* and *Pyrethrums*. BEALE, P. T. B., Everton, Lymington, Hants; Seeds of *Nicandra physaloides*, *Dierama pulcherrimum*. BEDBROOK, C., Wallington; Seed of *Streptocarpus* hybrid. BENNETT, J. C., British Columbia; Seed of *Rosa spinosissima*. BERCKMULLER, F., Hambourg-Volksdorf; Plants of *Iris aphylla*. BERESFORD, Lt.-Col. H. P., London; Seed of *Bignonia speciosa*. BERLIN-DAHLEM BOTANIC GARDEN, Germany; Collection of seeds. BEVAN, R., Henley-on-Thames; Plant of *Campanula Moreletiana*. BEVIS, H. J., Kenya Colony; Seeds. BLACKMORE & LANGDON, Messrs., Bath; Plants of *Rudbeckia* varieties. BLAKE, Lady M. JEX-, Salisbury; Seed of *Thunbergia* sp., *Delphinium* sp. BLANCHARD, D., Blandford; Seed of *Romulea bulbocodium*. BOLAS, T. W., Co. Down, Ireland; Seed of *Meconopsis violacea*. BOLTER, E. W., London; Seed of *Euonymus europæus* var. 'Bright Fruits.' BOOTH, F. H. A., Chiddingfold; Collection of plants. BOOTHMAN, H. S., Maidenhead; Plant of *Phacelia sericea*. BOYES, D., Cambridge; Grafts of Plums and Damson. BRANIN, Mrs., California; *Iris* 'Elizabeth Teubert.' BRIDGEFORD, J. M., London; Seed of Hollyhocks; plants of *Viola*, Scabious. BRITTON, Miss E. A., Devon; Collection of plants. BROOKLYN BOTANIC GARDENS, U.S.A.; Collection of seeds. BUCHAN, S. J. W., London; Seeds from Italy for identification. BUNYARD & Co., Messrs. G., Maidstone; Runners of Strawberry 'American Seedling.' BUNYARD, E. A., Maidstone; Books for the Library. BUTLER, E. D., Federated Malay States; Seeds of *Torenia* sp. BUTLER, Mrs., Cobham; Plants of Canterbury Bells. BYNG OF VIMY, Lady, Thorpe-le-Soken; Collections of plants, seeds and cuttings. BERKELEY BOTANIC GARDEN, University of California; Collection of *Primula* and *Rhododendron* seeds. CAMBRIDGE BOTANIC GARDEN; Collection of plants and cuttings. CAMPBELL, D., Regent's Park; Collection of plants and cuttings. CANE, Sir JOHN DU, Godalming; Cutting of *Gazania*. CARBONELL, Mrs., Bideford; Seed of *Aquilegia viridiflora*. CECIL, Mrs. GASCOYNE, Billericay; Seeds of *Kinoa* plant from Bolivia; plants of *Chenopodium album*, per Mr. WRIGHT, St. Albans. CHITTENDEN, F. J., R.H.S.; Collection of seeds; tubers of *Commelina* sp.; *Lilium Lowii*. CHRISTIE, T. NORTH, Moray; Seed of *Primula Winterti*, *Meconopsis* sp. CLARK, Col. GORDON, Cobham; Plants of *Dianthus arvernensis*; bulbs of *Lilium myriophyllum*. CLARKE, —, Southport Parks; Plants of *Rudbeckia speciosa*. CLARKE, Col. STEPHENSON, Borden Hill; Plants of *Rhododendrons*, *Acers*, etc. CLAY, Mrs. SPENDER, Lingfield; Bulbs of *Lilium Parryi*. CLIBRANS, Messrs., Altrincham; Collection of plants. COLEY, Miss H. M., Reigate; Seed of *Salvia pratensis*. COPENHAGEN BOTANIC GARDEN; Collection of seeds. CORREVON, Messrs. H., Geneva; Collections of seeds and plants. CULVERWELL, Mrs. A. F., Redhill; Seedling gathered in Algiers. DENHAM, Dr., Oxford; Collection of Willow and Poplar cuttings. DICKSON, Miss A. M., Dumfriesshire; *Leucojum trichophyllum*, Scented Pelargonium. DIMSDALE, Miss P., Lechlade; Seedlings of *Lysichiton camtschatcense* and *Iris albo-purpurea*. DIVERS, W. H., Hook; *Lilium candidum*; dried specimens of Florida plants for Herbarium. DONARD NURSERY Co., Co. Down, Ireland; Collection of shrubs. DONCASTER, —; Plants of *Erica ciliaris alba*, *Gentiana Froelichii*. DOUGLAS, J., Bookham; Plants of border Carnations. DUNEDIN BOTANIC GARDENS, New Zealand; Collection of seeds.

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

SUBSCRIPTIONS.

There are still some Fellows of the Society whose subscriptions are outstanding. In view of the Chelsea Show in May a special reminder will be sent out during this month, but it would be of considerable help if Fellows whose subscriptions are in arrear would forward them as soon as possible.

CHELSEA SHOW.

Chelsea Show will be held on May 22, 23, and 24, in the grounds of the Royal Hospital, Chelsea. It is gratifying to be able to report that this year special arrangements have been made with the Royal Automobile Club, in conjunction with the police, for the more convenient direction of traffic and parking of cars. It is proposed to issue with the May JOURNAL a special leaflet which will contain a plan, giving traffic directions and the situation of the car parks.

Fellows are reminded that the Chelsea Show is invariably very crowded between certain hours—from about noon until 4.30 P.M.—and in view of the Silver Jubilee there is likely to be a considerable influx of visitors from overseas. It would, therefore, add considerably to the comfort of all if more use were made of the earlier and later hours of the Show.

CONFERENCES

Conference on Daffodils.

The Conference on Daffodils will take place in the Lecture Room of the New Hall, Greycoat Street, S.W. 1, from Tuesday, April 16, to Thursday, April 18.

Programme of Conference.

TUESDAY, APRIL 16, AFTERNOON AT 3.30.

- (i) Opening address by the Lord ABERCONWAY, C.B.E., V.M.H., President of the Royal Horticultural Society.
- (ii) *British Daffodils—past and present. Mr. P. D. WILLIAMS, V.M.H.

WEDNESDAY, APRIL 17, MORNING AT 10.30.

- (iii) *Narcissus species. Mr. E. A. BOWLES, M.A., F.L.S., V.M.H.
- (iv) The Daffodil trials.
 - (a) General Survey. Mr. F. J. CHITTENDEN, F.L.S., V.M.H.
 - (b) *The Wisley trials. Mr. F. C. BROWN.
 - (c) *The Kirton trials. Mr. J. C. WALLACE.
 - (d) *The Gulval trials. Mr. H. W. ABBISS, N.D.H.

WEDNESDAY, APRIL 17, AFTERNOON AT 2.30.

- (v) *The preparation of Daffodils for forcing. Prof. Dr. E. VAN SLOGTEREN.
- (vi) *The breeding of Daffodils. Mr. GUY L. WILSON.

* These papers will be illustrated by lantern slides.

1 PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

THURSDAY, APRIL 18, MORNING AT 10.30.

(vii) The commercial cultivation of Daffodils.

(a) For flower production. Mr. G. W. LEAK, V.M.H.

(b) For bulb production. Mr. A. W. WHITE.

(viii) Diseases and pests of the Daffodil; their detection and control.

Mr. F. A. SECRETT, F.L.S.

A Dinner will be held in the Restaurant of the New Hall on Tuesday, April, 16, at 7.30 P.M., in connexion with the Conference. (Morning dress; tickets price 7s. 6d.) Fellows wishing to attend are requested to apply to the Secretary, forwarding the price of the tickets with their application.

Excursions in connexion with the Conference.

I. On Thursday afternoon, April 18, there will be an excursion to the Society's Gardens at Wisley, and to Mr. F. A. Secrett's Flower Farm at Walton-on-Thames. The return fare by motor coach will be 3s. 6d.

Time table :

2.00 P.M. Motor coach leaves New Hall, Greycoat Street, Westminster.

3.15 P.M. Party assembles at the main entrance at Wisley. Inspection of Daffodil Trials and famous wild garden.

4.45 P.M. Tea will be available in the entrance hall of the Laboratory at 1s. 6d. each.

5.15 P.M. Motor coach leaves for Walton-on-Thames.

5.45 P.M. Party arrives at Holly Lodge Farm, Walton-on-Thames. Inspection of commercial cultures of Daffodils, by the courtesy of Mr. F. A. Secrett.

6.45 P.M. Motor coach leaves for London.

7.45 P.M. Motor coach arrives New Hall, Greycoat Street, Westminster.

II. On Friday, April 19, there will be an excursion to the bulb-fields at Spalding, and to the Spalding Daffodil Show. The party on this occasion will be limited to seventy persons. The railway return fare from King's Cross to Spalding will be 5s. 6d.

The programmes giving the full arrangements of these two excursions will be sent on application. An early intimation by those who wish to join either of these parties will considerably facilitate the administration, and help to make the excursions as comfortable as possible for all.

A Daffodil Show will be held at Heemstede, Holland, from April 12 to April 22, as part of the Heemstede International Flower Show, which will continue until May 20. Particulars of the travel facilities available for those who wish to visit the Show may be had from Messrs. Thomas Cook & Son, Ltd., Berkeley Street, W. 1.

Conference on Cherries and Soft Fruits.

The Cherry and Soft Fruit Conference to be held on July 16 and 17, 1935, will treat of the following subjects: "Cherries for Market Growing Purposes," "Growing Healthy Strawberries," "Nutrition and Manuring of Soft Fruits," "Growing Healthy Raspberries," "Soft Fruits for the Private Garden," "Blackberries and like Berries for Garden Purposes," and "The Bottling of Soft Fruits." Fellows desiring further particulars are requested to notify the Secretary.

International Conferences.

During the autumn of this year two International Conferences are to take place. The first, the International Botanical Congress at Amsterdam, on September 2-7: the second, the International Horticultural Congress at Rome, on September 16-21. Any Fellows desiring particulars of these two Conferences are asked to apply to the Secretary.

Conference on Alpine Plants, 1936.

The preliminary programme for a Conference on Alpine Plants to be held in May next year is now settled.

The Conference is spread over three days. The first afternoon, May 5, is to be devoted to two subjects: "Early History of Rock Gardening from the Fifth Century to the Nineteenth Century" and "The Rise of Modern Rock Gardening and its Future." The subjects on May 6 will be "Utilization of Natural Slopes" and "Utilization of Flat Sites," and "Cultivation of Rock Plants in General" and "Cultivation of Difficult Plants." On May 7, discussions will take place on "The Alpine House" and "Propagation."

All Fellows interested in this Conference are asked to notify the Secretary.

CALENDAR.

April 9, 1-7.30 P.M., and April 10, 10 A.M. to 5 P.M.—Spring Show of the British Carnation Society. Fellows' tickets will admit.

April 16, 1-7.30 P.M., and April 17, 10 A.M. to 5 P.M.—Fortnightly Meeting in the Old Hall, whilst in the New Hall the Daffodil Show will be staged. This fortnightly meeting is not provided for on the tickets, and has been specially arranged. It is hoped that by combining a fortnightly meeting with the Daffodil Show many Fellows who are particularly attracted by the Daffodils will be interested to see the other plants and flowers in season, and conversely those who are more interested in a general show will spend time also in the Daffodil Show.

The particulars of the Daffodil Conference have been given on p. xlix.

At this time of the year new Rhododendrons and Irises are likely to be ready to exhibit, and the arrangement of a fortnightly meeting on this date allows them to be dealt with as well as the new Daffodils.

April 24, 1 to 7.30 P.M., and April 25, 10 A.M. to 5 P.M.—Fortnightly meeting in the New Hall, and Early Market Produce Show in the Old Hall.

Attention is drawn to the fact that the first day of these two shows falls on a Wednesday, owing to the Easter holiday.

On this occasion a Silver Cup for Auriculas, kindly presented to the Society by Mr. K. D. CORSAR, to be won outright, is offered for the best twelve varieties of show Auriculas: not fewer than two green-edged, two grey-edged, two white-edged, and two self-coloured varieties, nor more than one plant of any variety may be shown in the group, and no plant may have more than one truss. The closing date for entries is April 17.

At the fortnightly meeting the National Auricula and Primula Society will also stage their exhibits.

It is believed that this year's Early Market Produce Show, the fourth of its kind organized by the Society, will be more comprehensive than any held before, and will give Fellows an opportunity of seeing the high quality of early market produce produced in British gardens well staged, and packed as it should be for market purposes.

On Wednesday afternoon, April 24, there will be a lecture in the Lecture Room of the New Hall at 3.30 P.M., by Mr. F. A. SECRETT, on "Irrigation of Horticultural Crops."

April 30, 1-7.30 P.M., and May 1, 10 A.M. to 5 P.M.—The Rhododendron Association will hold its Annual Show in the New Hall, and in the Old Hall at the same time the second show of the Alpine Garden Society will be arranged. Fellows' tickets will admit to both shows.

Attention is particularly drawn to a lecture on "Tulip Species," which will be given at 3.30 P.M. in the Lecture Room of the New Hall by Sir DANIEL HALL, K.C.B., F.R.S. It is hoped that in spite of the fact that this lecture does not fall on the day of an ordinary fortnightly meeting, not only Fellows visiting the two shows, but also members of the two Societies staging these shows will attend. Should the season prove favourable a number of species of Tulips will be exhibited in the Old Hall.

May 8, 1-7.30 P.M., and May 9, 10 A.M. to 5 P.M.—Fortnightly Meeting. In view of the Silver Jubilee Celebrations this fortnightly show commences on a Wednesday. This show is always interesting and all spring flowers and forced shrubs are well represented.

In the Lecture Room of the New Hall at 3.30 P.M. on May 8 Lady ROCKLEY will speak on "The Wild Flowers of the Dominions."

In the afternoon of May 8 at 4.30 in the Restaurant of the Old Hall the Lily Group will meet, and "Cultivation of Lilies in Pots" will be discussed.

May 21-24.—Chelsea Show in the Royal Hospital Grounds, Chelsea. For particulars, see p. xlix.

WISLEY GARDENS.

Demonstrations in Garden Practice.

The third demonstration to take place this year will be held on April 10 and 11. The subjects will be "The Spring Spraying of Fruit Trees" and "Shrub Pruning." Fellows intending to be present on either of these days should notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, so that adequate arrangements can be made.

The Garden.

Fellows will no doubt be interested to see the alterations that have been carried out during the past winter in making a wide grass walk from the Fruit Exhibition Room to the western border of the Garden above the Alpine House.

lii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

This walk will be flanked by borders of annuals and is backed by a double row of Japanese Cherries.

The ground formerly occupied by herbaceous plants to the east of the new herbaceous borders has been levelled and the area of lawn thereby increased.

The Alpine House now contains a great amount of flower, and on the rock garden the smaller bulbs, Primulas, Saxifrages, Pulmonarias and many of the dwarf species of Rhododendron are at their best. Some of the larger species will be in flower in the wood, where Camellias may be expected to be in full beauty and many dwarf woodland plants to be in bloom.

In Seven Acres the Heaths are still flowering and late spring species are beginning to flower, while many trees both here, in the old garden and in Howard's Field will be in bloom. Cherries and the earlier Crabs both promise much flower.

There are always many plants in flower, too, in the Temperate House.

Trial.

Trials under glass include new forms or strains of Schizanthus, Calceolaria and Cornflower, and all are likely to be in bloom during April. They should be sought in the house next the Temperate House.

The great trial of Daffodils of over 250 varieties selected for their value for garden decoration should be at its best. It is planted at the western end of Seven Acres. The first flowers to open were 'Brandon' and 'Maximus Superbus' on February 28.

White Fly Parasite.

The parasite of the greenhouse white fly, *Encarsia formosa*, has proved extremely effective in checking the increase of this pest under glass where it has been introduced and large numbers have been distributed during the past few years. The demand has become so great that in order to meet in a measure the cost of maintaining the parasite over the difficult winter months and packing and despatching it, the Council has fixed a charge of 2s. 6d. for a supply for a small house and 5s. for a large house, and applications for it should be accompanied by the sum named. It is useless to introduce it to houses until the average temperature is about 70° F. Early application should be made since the supply is limited, and it is hoped that Fellows who have found it successful will distribute it in their neighbourhood.

Antirrhinum Rust.

Arrangements have been made to carry out spraying experiments at Wisley against Antirrhinum Rust if it should appear this season, as well as to test alleged resistant varieties. Of one hundred and six varieties grown last year at Wisley not one showed any evidence of resistance to the disease.

HALL LETTINGS.

The Society's Halls have been let for the following event.

May 18-25, Co-operative Wholesale Society's Exhibition to be staged in both halls. Particulars may be had from the Secretary, 1 Balloon Street, Manchester.

PRESERVATION OF BOX HILL.

Many Fellows will be interested to know of the effort that is being made to secure from the speculative builder the estate of the late Sir Trevor Lawrence, who was President of this Society from 1885-1930, and of his son, Sir William Lawrence, Treasurer and Councillor for many years. The estate forms the foreground of the most striking view of Box Hill which is already vested in the National Trust, and one that is seen by everybody who passes along the London-Dorking Road. Over £3,000 has already been subscribed, and should any Fellows desire to contribute to this fund, perhaps they would address their communications to the Box Hill Fund, c/o The Editor, *Country Life*, 20 Tavistock Street, Covent Garden, W.C. 2.

SPECIAL NOTE.

In view of inquiries received and in order to avoid any misunderstanding on the part of the Fellows of the Royal Horticultural Society, the Council of the Society wishes it to be known that the appeal which has been made in connexion with Erlestoke Park, Wiltshire, has not been in any way made with the support or under the auspices of the Society.

ANNUAL GENERAL MEETING.

FEBRUARY 19, 1935.

REPORT of the ONE HUNDRED AND THIRTY-FIRST ANNUAL MEETING of the Fellows of the Society, held in the Lecture Room, New Hall, Grey-coat Street, Westminster, on Tuesday, February 19, 1935.

The Lord ABERCONWAY, C.B.E., V.M.H. (President), in the Chair, supported by Members of Council and about two hundred and thirty Fellows.

The SECRETARY read the notice convening the Meeting.

The SECRETARY announced that the Minutes of the last Meeting, held on February 20, 1934, had been circulated in Vol. 59, Part 2, of the JOURNAL.

The CHAIRMAN then moved that the Minutes be taken as read, and that they be adopted.

The motion was agreed and the Minutes were signed by the Chairman.

The PRESIDENT : I now beg to move that the Report of the Council for the year 1934 be and is hereby approved and adopted.

That Report is a somewhat exhaustive one and deals, as it should do, very fully with the progress of the Society and with the many activities of your Council. I think I may assume that you have all studied it, that you all know it as well as the authors, and that you do not desire me to go through in any detail this afternoon the matters therein dealt with. But if there is any Fellow who would care to ask any questions on the subject-matter of that Report, or on any of the Society's affairs, the Treasurer—if the questions are financial—or I, myself, will be very pleased to answer such questions before this motion is put to the meeting.

We are all very glad to see throughout that Report abundant evidence of the continued prosperity of our Society. If you take the test of our Fellowship, which is, perhaps, the most material one, the Roll on that mysterious and traditional date of November 8, 1934, numbered 29,880. It showed a gross increase of 3,597 during the year and a net increase, after deducting losses by death and resignations, of 1,483. I am glad to be able to add that the increase in the Fellowship has been continuous since that date and that the number now stands at no less a figure than 30,188.

The magnitude of these figures leads us to ask whether there shall be some limit to the size of the Society. Some limit could, of course, easily be imposed by restoring the entrance fee or by raising the subscription in the case of new or additional Fellows. Some Fellows there are who undoubtedly think that the numbers of the Society should be limited. They say : Why add to the crowd at your Shows ? Why add to the numbers of Fellows that we do not know ? I would, however, venture to differ from that view. I would differ from it, in the first place, on financial grounds. The average expenditure that the Society makes on each Fellow is in the neighbourhood of 30s. per annum. But when you have Fellows additional to the existing number—an addition which does not, of course, require any great increase of staff, or any increase in the expenditure at Wisley or on the Shows—those additional Fellows only cost the Society about 3s. per annum each. You will therefore see that if we have a larger number of Fellows, we have a surplus which would enable us to give better service to our Fellows at the Shows, at Wisley in connexion with research, or by advice, or in other ways.

I would advance a further argument. It is this : the greater the attendance at Shows, although there may perhaps in some cases and at some hours be some little inconvenience through overcrowding, the more encouragement is given to the exhibitors, and the better, brighter, larger and more numerous will be the exhibits.

But I would put the matter on an even wider ground than this. As I take it, the function of this Society is to encourage horticulture generally. I would therefore say, let us interest and let us help the largest possible number of people, remembering always that the larger the Society is, the larger the dividend we shall declare of useful service to horticulture in general and to our Fellows in particular.

I am glad to hear from many quarters that our friends and allies of the horticultural trade are also experiencing greater prosperity than was the case some months back. That shows, to my mind, that more people are gardening, more people are making gardens, more people are enjoying gardens, and I hope and believe that this is at any rate partly due to the work, to the influence, and to the size of our Society.

Now may I turn for a few minutes to some of the activities of the Society. Let me take Wisley Garden. That garden, as I think you will agree, is growing each year in beauty and in interest. It would be a great reflection on the Council and on those in charge of the garden if it did not do so, because all gardens should under good management grow in beauty and in interest. But I think it has grown especially rapidly in beauty and in interest under the skill of Mr. Harrow, helped by the advice of Mr. Musgrave, who has given a great deal of time to visiting Wisley on our behalf. I think that every Fellow should visit Wisley, not only once a year but several times a year, because Wisley changes from month to month, and at every time of the year there are things to be looked at. In fact, I have in mind that we might have a large poster in our Halls bearing the legend for our Fellows, "Wisley is good for you." If you go to Wisley this summer you will, I trust, be pleased with the progress of the great new herbaceous borders laid out the winter before this, and which should be now attaining their full beauty. You will be interested, I think, in the plot of land devoted to growing those plants—whether trees, shrubs, herbaceous plants or bulbs—which have received the Award of Garden Merit. I think a garden laid out entirely with these plants should be a garden which it would be difficult to surpass. You will be interested also, I think, in the greenhouses, in which we are growing plants just too tender to succeed out of doors at Wisley. One of them is modelled upon the famous rock garden house at the Edinburgh Botanic Garden, while in the other are grown half-hardy shrubs which have made remarkable progress in the three years since they were planted. I think that you will also see throughout the garden a great number of new and rare plants, but I hope that in most instances those new and rare plants are only grown when they are really better or more beautiful than the older or the more common plants.

You will observe also that we are carrying out improvements in the garden which will mature in future years. We have planted on the hill two great double avenues of Japanese cherries of different varieties. We are also dealing with that field where you will remember that conifers have in the past struggled with adversity and have lost much of their beauty in the struggle. We are planting that field with trees and shrubs which have a brilliant autumn colour, because Wisley has the kind of dry soil and climate which is particularly suitable for plants which are grown for their autumn tints. We are clearing, and we propose to plant, the field behind the new herbaceous borders, rather a derelict piece of land, which we think might be so utilized to more advantage.

Lastly, though perhaps this will not appeal so much to visitors except in its results, we have decided thoroughly to reorganize the garden water supply, and to have sprays all over our rock garden on the famous model systems installed at Edinburgh and Kew. We are undertaking, at Wisley, also the difficult task of reconciling as far as possible progress with economy. You will observe that, except for the herbaceous borders to which I have referred, and which are to some extent a replacement of existing borders which have been used for other purposes,—except for the two herbaceous borders, most of our planting is of trees and shrubs which give I think a maximum of interest and beauty with a minimum of labour. We have also, in the interests of economy, reduced substantially the size of the standard collections that we grow, by eliminating from them a great number of second-rate plants, supplementing them, however, where necessary, with first-class varieties.

Those of our Fellows who are interested in fruit, either because they grow it for themselves, or are in the much larger category of those who merely eat it, ought to visit our fruit trials grounds. By now the older trees form fine examples of the fruit which ought to be grown in every garden, although when you see the trials you must remember also the great work that is being done for growers of fruit in eliminating those new varieties which can be proved to be unworthy of further cultivation.

Another branch of our activities to which I desire to refer, is our JOURNAL. You will remember that last year I foreshadowed the change that was to take place in the fashion of it. The old tradition of over a century was not lightly discarded, but that old tradition assumed that the appetite of the horticultural reader rather resembled that of that interesting animal the boa-constrictor, which likes a huge meal at very infrequent intervals. The present form of JOURNAL

provides for the horticultural reader, lighter meals, I believe and hope daintily served so as to tempt even the most fastidious of appetites. Of course, to publish a journal monthly, is more work for the Editor and his staff, but I think we must congratulate Mr. Chittenden both on the result of the publication and also on the punctuality with which every number of that JOURNAL has appeared. I think that Mr. Chittenden would welcome for the purposes of the JOURNAL any notes contributed by Fellows on really interesting plants which grow in their gardens.

Among the minor troubles of gardening to which your Council has given consideration, is the question of plant names. We gardeners sometimes regret the kind of names that botanists give to plants. Some names, of course, are euphonious and easily remembered, but I would remind botanists that some of the names given to newly-discovered plants—if I may use to botanists the same kind of word that the botanists use to us—may not unfairly be described as a "cacophonous agglomeration of pseudo-classical polysyllables."

Gardeners are to some extent reconciled to the necessity of enduring this class of name, but what does really vex them is when, to use more simple language, a name has been given to the plant, and that name does not "stay put." Of course there are good grounds in some cases for altering a name; there may be changes in the identification of a plant; there may be cases of overlapping species, but I think that gardeners do rather greatly resent a change when it is merely the result of research into long-forgotten priorities and consequent on the rule that the name first given to a plant should be the name to be adopted. The common larch now appears under the name of *Larix decidua*. A well-known owner of a large nursery who is very particular in naming his plants rightly in his catalogue, informs me he has had a very large number of orders for *Larix decidua* from readers of his catalogue who fondly believe that they now are getting a plant new to science.

Your Council after considering the position have decided to appoint a Committee representing not only botanists, but gardeners who are specially interested in the cultivation of various families of plants, for the purpose of settling and recommending to the International Horticultural Conference, which will meet this Autumn at Rome, the adoption of certain lists of plant names. The Conference decided at their last meeting as far as names of genera are concerned, that when a list of names is approved by the Conference, those names shall be standardized for six years and shall not be altered at the end of that time without the express approval of the Conference. The Conference has, in addition, already expressed its view that the same rule shall be applied to the names of species and also to the names of garden plants. We think if a strong Committee which carried weight were appointed to go through such names and prepare before the Conference lists to be submitted to it, we should have a very good chance of getting these lists agreed to and of getting the names on the lists stabilized for six years, with every prospect at the end of six years that they would not be changed without very good reason. I trust that the International Conference at Rome may be more decisive in its results than some International Conferences on other matters that have been held at Geneva and elsewhere.

I am able to announce to the Society we are to receive this year two notable gifts, one referred to in our Report, consequent on the death of the late Mr. Cory, a life-long supporter of horticulture in general and of this Society in particular. Mr. Cory has bequeathed to the Lindley Library a legacy, free of duty, of all his botanical and horticultural books. When I say that that collection was the work of many years and is rich in rare and sumptuously illustrated works, I think that the meeting will realize what an addition it will be to our Lindley Library.

The second gift is consequent on an event which calls for our congratulations. Sir Jeremiah and Lady Colman are celebrating their Golden Wedding on the 25th of February, and by a very generous reversal of the usual procedure, he proposes to give to the Society a golden gift, to wit the sum of one thousand pounds which he desires should be used at the discretion of the Council, but in consultation with him, for the encouragement of the production of new plants, whether by hybridization, collection, or introduction. We are very grateful to Sir Jeremiah Colman for that kindly and generous thought, and I am sure that the meeting will send him not only their very best thanks, but their good wishes on such an interesting occasion and their cordial hopes that in due course he may also celebrate his Diamond Wedding.

On the Council as usual there are changes. We all regret the loss this year of the services of Mr. Nix, who has been on the Council for some twenty-two years and has so great a knowledge of fruit that one is almost apt to forget how great an authority he is on gardening generally.

Sir Daniel Hall we also lose, a man who is an encyclopædia of knowledge on matters scientific and on matters governmental.

Both these gentlemen as you will have observed have been proposed and, as will be announced shortly, have been elected Vice-Presidents of our Society.

Mr. Monro we are also losing. He represents most ably the business side of horticulture and is as generous in his services to horticulture as he is in all other matters, and as efficient.

We very much regret not to see among us to-day our old friend, Lord Wakehurst, who for very many years has never missed an Annual Meeting of the Society. Unfortunately, he is absent through his doctor's orders. I am sure we all send him every good wish towards his convalescence.

We gain on the Council in place of those who are retiring, two former members, Mr. Bunyard and Mr. Stern, stalwarts respectively of the apple and of the lily, men both of knowledge and of energy. We gain also a member new to the Council, Professor Weiss, ex-President of the Linnean Society, a most distinguished scientist who has honoured Wisley of recent months by carrying out some of his research work in our laboratories.

We have added to our list of Honorary Fellows by electing certain men of distinction both at home and abroad whose inclusion on our roll we thought was not only due to their scientific attainments, but who would add lustre to our Society.

In conclusion, Ladies and Gentlemen, I would wish to convey the thanks of the Council, and I believe the thanks also of this meeting representing the Fellows of the Society, firstly, to our Staff, a skilled, loyal and hard-working staff who have done so much to contribute to the prosperity of our Society. I have observed of all of them from the highest to the lowest that they seem to make a pleasure of their duties.

Secondly, I should like to convey the thanks of the Council to all the friends of the Society. Our Society is very rich in its friends, whether we look to the members of our various Committees, or to the judges at our Shows, or to the owners of and contributors to the Horticultural Press, or to our exhibitors, or whether we look among the ranks of our Fellows, there we see friends of the Society, friends who work very hard for the Society, who contribute much to its prosperity, and friends may I add, who look, as I know, with very indulgent eyes on the shortcomings of your Council which I may tell you in confidence are very few, and on the shortcomings of your President which I know are many.

I call on Mr. Trotter to second the resolution which I have moved.

Mr. R. D. TROTTER: I am sorry that, owing to a cold, I cannot make myself heard very well, but perhaps the Secretary will not mind reading my Statement, which is made in seconding the Resolution.

The SECRETARY read the following Report:—

The rapid expansion of our Membership, following on the check in 1932, when the economic crisis called a halt in so many institutions in this country, has now increased the total number of our Fellows to thirty thousand. This expansion is the explanation of most of the changes in our accounts in the last year.

Turning to the Revenue and Expenditure Account, you will see that Subscriptions are up by £2,400; Dividends increased by £200; and Receipts from Hall Lettings by £300. As against these, our Establishment expenses in London increased by £750, chiefly printing and postage.

The usual two half-yearly parts of the JOURNAL were issued, as well as four of the new monthly parts, now sent to all Fellows, costing £1,800 more than last year. Two editions of the Lily Year Book, costing £500, come into this year's figures, but owing to an increased revenue from sales and advertisements of £700, the net increase in cost of publications is £1,260.

The net cost of meetings shows a decrease of £830. We have again allocated sums to the Spring and Autumn Meetings, to cover their share of the total overhead expenses of our staff at Vincent Square. We had fine weather for Chelsea and good gate receipts, but the Autumn Show receipts were less by nearly £200.

Cups and medals show an increase of £330; most of this is for stock and cups presented to the New York, Toronto and Victoria centenaries.

Special Expenditure shows an increase of £1,000, accounted for by the purchase of an addressograph machine and an appropriation towards the cost of a Journal Index, which will incorporate an up-to-date List of Awards of Merit.

Botanical Magazine.—In the 1933 Balance Sheet on the assets side, we had a figure of £671 for work done in advance of publication. This item was increased this year to £698, and the Council decided no longer to treat this as an Asset, but to write it off to Revenue, leaving only the stock figure—£100—in the Balance Sheet. The figure of £576 represents the cost of publication, less subscriptions and sales.

The two Restaurants have done better and show a reduced cost of £110.

The Council decided to place the Sinking Fund for the Old and New Halls on a forty-year basis instead of sixty years as originally arranged. This has had the effect of increasing the annual contribution from £980 to £3,366. In view of this increase the Balance for the year, £6,422, may be considered satisfactory.

In the Balance Sheet (pp. xii, xiii), I would point out that a figure equal to the cost of the General Investments, £7,592, made in 1933, has been transferred from the Revenue and Expenditure Account (at the bottom of the page on the liabilities side), to the Capital Funds Account (at the top of the same page). In this way we hope in due course to balance the Capital Funds Account with the item "Capital Expenditure" on the assets side.

For the first time for some years since the building of the New Hall, we have finished the year without having to include an overdraft at the Bank under "Sundry Creditors." The present figure £3,100, includes such items as £900 for issues of the JOURNAL; Income Tax Schedule A, £700; Hall lettings payable in advance, £400; and the £500 for the Journal Index to which I have referred.

On the Assets side you will see "Botanical Magazine" standing at the nominal value of £100 for the old stock.

"Old and New Halls Sinking Fund" is considerably larger on account of the increased contribution already mentioned.

"Sundry Debtors" includes the usual items for Rates, Restaurant, Advertising Accruals and Hall Lettings, and we finish up with a respectable balance at the Bank.

Some investments have been sold and re-invested during the year with profitable results, and as will be seen, the funds concerned have been credited with their respective profits.

Meanwhile it is satisfactory to note that the market value of the investments in all the Funds on this occasion is higher than their cost price.

The ordinary expenditure at Wisley has altered very little, but the special expenditure is £400 less than last year, and includes new Fire Appliances, and the cost of the new herbaceous border.

Thanks to a good fruit crop as against practically none in the previous year, sales of fruit, gate takings, and Trial Entry Fees increased the receipts by £650, and the net cost of Wisley for the year is reduced by £760.

A word of explanation is perhaps necessary on the Ministry of Agriculture contribution to the Fruit Trials, namely £125—we had already received £360 in respect of the year 1933, the two sums together making £485—to April 1934. Last month we received a further sum of £485, to April 1935.

The only material change in the Wisley Balance Sheet is the addition of £478 12s. 8d. to the Endowment Trust Fund investments. This is done in order to bring the investments up to the level of the Fund.

Mr. R. D. TROTTER: I have much pleasure in seconding the adoption of the Report.

The CHAIRMAN: The motion has been moved and seconded. Does any Fellow desire to ask any question or make any remarks? If not, I will put the motion to the meeting.

(Motion put and carried unanimously.)

Mr. C. T. MUSGRAVE (Vice-Chairman): Ladies and Gentlemen,—There is only one nomination for the President. Consequently in accordance with Bye-Law 57, I hereby declare Lord Aberconway duly elected President for the coming year.

The CHAIRMAN: I can only say that I appreciate most highly the very distinguished honour that the Council have done me in nominating me as President for the coming year, and that the Fellows have done me in confirming that nomination. I can only say I shall make the best return that it is in my power to make by doing all I can to further the interests of the Society which you and I have so much at heart.

I declare that the following have been duly elected as Vice-Presidents :—

The Duke of Bedford.
The Duke of Portland.
The Viscount Ullswater.
Lord Wakehurst.
Sir Daniel Hall.
The Rt. Hon. Sir Herbert Maxwell, Bt.
Lt.-Col. Sir David Prain.
Mr. E. A. Bowles.
Mr. C. G. A. Nix.
Mr. J. C. Williams.

I declare the election as Members of the Council of :—

Mr. E. A. Bunyard.
Major F. C. Stern.
Professor F. E. Weiss.

I further declare the election of Mr. R. D. Trotter as Treasurer.

I also declare the election of Mr. J. S. Feather, of Messrs. Harper, Feather & Paterson, as Auditor.

PRESENTATIONS.

Victoria Medals of Honour.—To British Horticulturists resident in the United Kingdom and deserving special honour at the hands of the Society.

Mr. MUSGRAVE : Ladies and Gentlemen,—For one brief moment and with your leave I am going to ask you to allow me to depose the Chairman.

Lord Aberconway, your garden at Bodnant is at once the envy and admiration of all gardeners. Your exhibits at the Fortnightly and Chelsea Shows are of the greatest interest to every Fellow of the Society. Your enthusiasm and skill in the growing of rare and beautiful plants is boundless. Acting on behalf of the Council I have the very greatest pleasure in handing to you the Victoria Medal of Honour, for your work in the introduction and growing of rare and uncommon plants, an honour you richly deserve.

The CHAIRMAN : I thank you Mr. Musgrave, and I can assure you I appreciate this great honour the more in that the diploma is signed by all my friends and colleagues, the members of the Council.

The SECRETARY : Mr. Wm. Hales, a member of the Society's Scientific Committee and Board of Examiners, for his work in connexion with the Chelsea Physic Garden.

The CHAIRMAN : Mr. Hales, I have great pleasure in presenting you with the Victoria Medal of Honour. You have had a long career in Botanical Gardens. You started work, I believe, at the Birmingham Botanical Garden, and you studied also at Kew. All of us should go and see the Chelsea Garden so as to judge what great strides Mr. Hales has made during his long term of office there. Perhaps we might add another poster "Chelsea is good for you."

The SECRETARY : Sir Arthur Hill, formerly a member of the Council of the Society, Director of the Royal Botanic Gardens, Kew.

The CHAIRMAN : Sir Arthur, I have very great pleasure in presenting you with the Victoria Medal of Honour. We present the Victoria Medal of Honour to you not because of the most distinguished position you hold, nor because of your many scientific attainments, but because of that one additional qualification, namely, that you are a great gardener.

The SECRETARY : Mr. George Monro, a retiring member of the Council of the Society, for his work in commercial horticulture.

The CHAIRMAN : Mr. Monro, I have very great pleasure in presenting you with the Victoria Medal of Honour. May you enjoy the possession of it for very many years. There is an especially interesting fact in regard to this particular medal. This medal is one which was presented many years ago by the Society to your father, and it is now to be owned by a son equally renowned in the horticultural world.

The SECRETARY : Mr. Charles R. Scrase-Dickins, a keen amateur gardener and a grower of difficult plants, who has been associated with the Society's activities during a long period of years.

The CHAIRMAN : Mr. Scrase-Dickins, I have great pleasure in presenting you with this Victoria Medal of Honour. I have paid many visits to your garden, where in your great wood you grow so many rare and beautiful plants on a matchless carpet of moss, a rare triumph of artistic planting. I congratulate you, and hope that you may enjoy it for many years to come.

The SECRETARY : Mr. Amos Perry, a raiser of new plants, especially Aquatics and Ferns, and a member of Floral Committee B.

The CHAIRMAN : Mr. Perry has been known to us all for many years as a man keen on the improvement of herbaceous plants and the introduction of new species, but of recent years Mr. Perry, if I may say so, has become amphibious ; he has taken to the water and now astonishes us with fine Water-lilies and queer fish.

The Associateship of Honour was then conferred on the following :—

Mr. F. S. BARRON, Manager of the Seed Department of Messrs. R. H. Bath, Ltd., Wisbech.

Mr. S. W. MCLEOD BRAGGINS, Superintendent of the Gardens of Mr. Cecil Hanbury at La Mortola, Ventimiglia, Italy.

Miss MARY E. BURTON, late Head Gardener to the Private Mental Institution, New Saughtonhall, Polton, Midlothian, and late President of the Scottish Horticultural Society.

Mr. W. B. GINGELL, late Superintendent of Dulwich Park (L.C.C.).

Mr. A. T. HARRISON, Head Gardener at the Training Centre of the National Committee for the Training of Teachers, Jordanhill, Glasgow.

Mr. E. R. JAMES, of Messrs. Sutton & Sons, Ltd.

Mr. G. NOBBS, Head Gardener at Osborne House, Isle of Wight.

Mr. C. P. RAFFILL, Assistant Curator at the Royal Botanic Gardens, Kew.

Mr. A. E. USHER, Head Gardener to Sir Randolph Baker, Bt., at Ranston House, Blandford, Dorset.

The Lawrence Medal.—To Mr. F. A. Secrett, for his exhibit of Vegetables and Flowers in Market Packages on April 17, 1934.

The Holford Medal.—To Mr. J. Pierpont Morgan, for his exhibit of Begonias on November 6, 1934.

Veitch Memorial Medal in Gold.—To Mr. E. A. Bunyard, for his contributions to Pomology.

Veitch Memorial Medal in Gold.—To Capt. F. Kingdon Ward, for his explorations and introduction of new plants.

Veitch Memorial Medal in Silver and £25.—To Dr. George Taylor, for his work on the " Genus *Meconopsis*."

The Sander Medal.—To Messrs. H. G. Alexander, Ltd., for *Cymbidium* " *Cassandra* " var. ' *Betty*,' shown on March 6, 1934.

The George Moore Medal.—To Mr. Lionel de Rothschild, for *Cypripedium* ' *Beersheba*,' shown on January 9, 1934.

Williams Memorial Medals.—To Messrs. Armstrong & Brown, for their exhibit of *Cypripediums* staged on January 9, 1934 ; and to Mr. J. Pierpont Morgan, for his exhibit of Begonias staged on November 6, 1934.

The Reginald Cory Cup.—To the Director of the Royal Botanic Gardens, Kew, for *Rhododendron impeanum* (*impeditum* × *Hanceanum*), shown on May 8, 1934.

The Loder Rhododendron Cup.—To Rt. Hon. Sir Herbert Maxwell, Bt., who, by his writings and paintings, has done so much to foster interest in the Genus *Rhododendron*.

That, ladies and gentlemen, concludes our presentations.

Sir ARTHUR HILL : It is my pleasure to ask you to pass a Vote of Thanks to Lord Aberconway, our President, for the very able way in which he has conducted the business this afternoon. He has given us an admirable summary of the work and activities of the Society. Though I am sure we botanists as well as you sympathize with him very much in the changes of names of plants which are

lx PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

necessary, from what he has told us it appears to be quite good for trade. The only way in which we can recognize on the botanical side his services, and if plants should be called after distinguished people, then our next new plant of any value should be named after him.

I should like to propose a very hearty Vote of Thanks to Lord Aberconway for having presided over us.

Mr. BUNYARD : I have very much pleasure in seconding that motion. I perhaps do it with even more force than Sir Arthur Hill. Sir Arthur has, unfortunately, retired from the Council, but I am going back again under the President's iron discipline. I have very much pleasure in seconding the Vote of Thanks.

(Vote put by Sir Arthur Hill and carried with acclamation.)

The CHAIRMAN : I thank you all most gratefully for the way in which you have received this Vote of Thanks. May I say that to preside over so interested and so friendly a meeting is its own reward.

That concludes our business. Ladies and gentlemen, I thank you.

(The proceedings then terminated.)

GENERAL MEETING.

FEBRUARY 19, 1935.

Grenfell Medal.

To Miss E. Savory, Sandgates, Chertsey, for an exhibit of paintings of flowers.

To Miss I. M. Charters, 34 West Avenue, Leicester, for an exhibit of drawings of flowers.

To Mr. A. G. Stubbs, 71 Berriedale Avenue, Hove, Sussex, for an exhibit of drawings of flowers, shrubs and fungi.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eight other members present.

Phylloxera on vines.—Mr. G. Fox Wilson showed a map of the British Isles indicating the recorded outbreaks of *Phylloxera* on vines in this country, and pointed out that it was found here before it was known on the continent of Europe.

He said in further reference to the recent outbreak in Berkshire, he was informed that a visit was paid to the garden on January 2, 1935, when it was ascertained that the vines "never had done well" over a long period of years, though they flourished for a year or so following planting-out in the borders, after which deterioration set in. The effect of the presence of the "*radicolæ*" from the roots is comparable to that of root pruning—the plants flourish for a period following the operation. The infestation was more severe on pot vines than on established rods growing in the borders. The leaf form ("*gallicolæ*") has not been observed in this instance.

There is no question but that the pest has persisted in these vineries for a considerable number of years, for new plants which were introduced to replace the dying ones were obtained from a reliable firm in whose nurseries the pest has at no time existed.

The first record of *Phylloxera* in England was made by Prof. Westwood in 1863 (*Gard. Chron.* June 20, 1863, p. 584), from material collected at Hammersmith by the Rev. M. J. Berkeley. Westwood refers again to the outbreak in 1869 (*Gard. Chron.* 1869, pp. 109 and 687), when he gave the insect the name of *Peritymbia vihsana*. It would appear that the presence of *Phylloxera* in England antedated its discovery on the Continent by nearly two years.

The last recorded outbreak is made by T. H. Middleton (*Ann. Rept. Hortic. Branch, Board of Agriculture and Fisheries*, 1912-1913 (1914), pp. 48-49), who makes the following statement regarding it: "The pest, though it can survive under exceptional conditions in England, spreads extremely slowly, never assumes epidemic proportions and takes many years to kill a plant, while many Vines in immediate contact are never affected. There is no reason for supposing that this pest can ever become a serious menace to English viticulture."

Mr. F. Laing, M.A. (British Museum, Natural History) informs me that the correct name for *Phylloxera vastatrix* Planchon is *Viteus vitifoliae* Fitch.

This pest is scheduled under "The Destructive Insects and Pests Order of 1922," and its presence must be reported to the Ministry of Agriculture and Fisheries, 10 Whitehall Place, London, S.W. 1. Failure to notify the authorities of the presence of any scheduled pest is an offence.

Iris reticulata.—Mr. Bowles drew attention to a pan of seedling, *Iris reticulata*, shown by Mr. Gray of Saxmundham. The plants were derived from a single

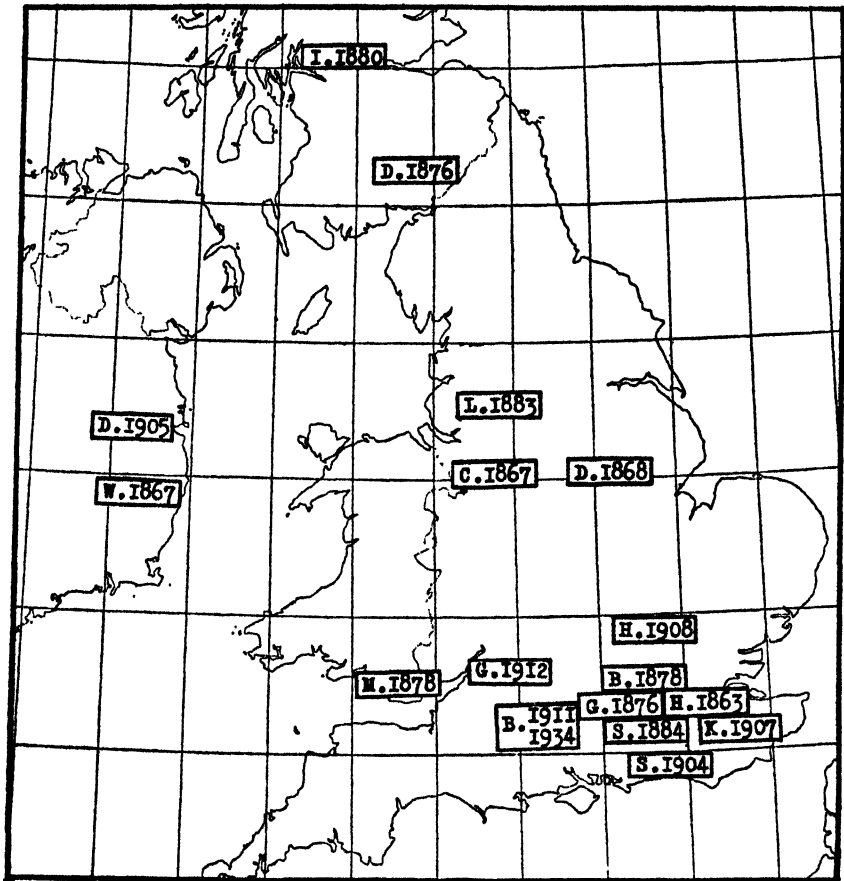


FIG. 52.—LOCALITIES WHERE PHYLLOXERA HAS OCCURRED IN THE BRITISH ISLES, WITH DATES OF OUTBREAKS.

seedling and had blue flowers about the height of the ordinary *I. reticulata*. Like other blue seedlings of *I. reticulata* this appeared to be of rapid increase and good constitution, unlike the shorter purple forms such as var. *Krelagei*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver-gilt Hogg Medal.

To Messrs. Rivers, Sawbridgeworth, for Citrus Fruits.

Other Exhibits.

Messrs. Cheal, Crawley : collection of Apples.

Messrs. Bunyard, Maidstone : collection of Apples.

Mr. W. H. Divers, V.M.H., Surbiton : Apple 'Cockle Pippin.'

W. Robinson, Esq., East Grinstead : Apple 'Reine Marie Joseph d'Othee.'

Lady Thorneycroft, Bembridge : Apple 'Ruby.'

Mr. T. W. Briscoe, Chepstow : seedling Apple.

Mr. H. Barnett, Tilehurst : Apple 'Rushock Pearmain.'

Mr. F. Streeter, Petworth : Apple 'Cox's Orange Pippin.'

Mr. E. A. Bunyard, Allington : Apple 'Cox's Orange Pippin.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Sutton, Reading, for Primulas.

Silver Flora Medal.

To Messrs. Bath, Wisbech, for Daffodils, Tulips and Hyacinths.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Carter, Raynes Park, for *Primula malacoides*.

To Messrs. Ryder, St. Albans, for Primulas.

To Messrs. Wakeley, London, for Crocuses.

Flora Medal.

To Messrs. Toogood, Southampton, for *Primula malacoides*.

Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, *Euphorbia fulgens*, etc.

The following award was recommended after trial at Wisley :

Award of Merit.

To *Primula malacoides* 'Presdales Double,' from Mrs. McMullen (gr. Mr. J. Underwood), Ware. See p. 176.

Other Exhibit.

Messrs. S. Low, Enfield : Carnations.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Waterer, Bagshot, for flowering shrubs.

Silver Banksian Medal.

To Messrs. Russell, Richmond, for flowering shrubs.

Flora Medal.

To Messrs. Barr, Taplow, for Narcissi and other bulbous plants.

To Messrs. Cheal, Crawley, for flowering shrubs.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Messrs. Neale, Newhaven, for succulents.

Banksian Medal.

To Messrs. Cheal, Crawley, for bulbous and alpine plants.

To Dartington Hall, Ltd., Totnes, for Saxifrages and other alpine plants.

To Hocker Edge Gardens, Cranbrook, for bulbous plants.

To Messrs. Stuart Low, Enfield, for Camellias and Epacris.

To the Rev. Canon Meyer, Hertford, for varieties of *Iris reticulata*.

To Messrs. Prichard, Christchurch, for alpine and bulbous plants.

To Messrs. Reuthe, Keston, for flowering shrubs.

To Messrs. Waterer, Twyford, for alpine and bulbous plants.

To Messrs. Wood, Taplow, for Saxifrages and other alpine plants.

First-class Certificate.

To *Prunus Amygdalus Pollardii* as a hardy flowering tree (votes 14 for, 5 against), from Lord Aberconway, Bodnant. See p. 176.

Award of Merit.

To *Fritillaria Karelinii* as a hardy flowering plant (votes 15 for), from Hocker Edge Gardens, Cranbrook. See p. 175.

Other Exhibits.

Lord Aberconway, Bodnant : *Leptocodon gracilis*, *Asara integrifolia*.

Alpine Nurseries, West Moors : alpine and bulbous plants.

Messrs. Blackmore & Langdon, Bath : *Delphinium macrocentron*.

John Gray, Esq., Saxmundham : *Iris reticulata* 'Benhall Blue.'

Capt. H. G. Hawker, Ermington : *Cassia corymbosa* var. *stipulacea*, *Acacia pycnantha*.

Miss Hopkins, Coulsdon : *Iris unguicularis* and other hardy plants.

Edward Howarth, Esq., Kirdford : *Ribes laurifolium*.

Mrs. Milford, Chedworth : alpine plants.

Capt. G. K. Mooney, Sevenoaks : *Fritillaria armena*.

Messrs. Redgrove & Patrick, Sevenoaks : shrubs and bulbous plants.

Messrs. Rogers, Southampton : shrubs and alpine plants.

Messrs. Russell, Richmond : *Medinilla javanica*, *Rhododendron javanicum*.

Messrs. Simmonds, King's Langley : *Cotoneaster hybrida pendula*.

Swanley Horticultural College, Swanley : *Begonia* spp.

A. C. T. Woodward, Esq., Bewdley : *Prunus dehiscens*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and sixteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for a group.

Silver Banksian Medal.

To Lord Aberconway, Bodnant, Tal-y-Cafn, for *Cypripediums*.

To Messrs. McBean, Cooksbridge, for a group.

Award of Merit.

To *Cattleya* × 'Remy Chollet' var. 'Our Prince' ('Monarch' × *Trianae*) (votes unanimous), from Messrs. Sanders, St. Albans. See p. 175.

To *Laelia* × 'Firefly' ('Coronet' × *harpophylla*) (votes 14 for, 1 against), from N. Prinsep, Esq., Pevensey. See p. 176.

Other Exhibits.

Messrs. Stuart Low, Jarvis Brook : a group.

Messrs. Black & Flory, Slough : a group.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended :—

Silver Banksian Medal.

To Mr. R. F. Calvert, Coverack, Cornwall, for an exhibit of Daffodils.

Banksian Medal.

To Messrs. J. R. Pearson, Lowdham, for an exhibit of Daffodils and Tulips in bowls.

Other Exhibits.

Mr. W. Fromow, Chiswick : group of Daffodils.

Messrs. Barr, 12 King Street, Covent Garden, W.C. 2 : *Narcissus* 'Ptolemy,' which the Committee desired to see again.

JOINT RHODODENDRON COMMITTEE.—Lt.-Col. STEPHENSON R. CLARKE in the Chair, and six other members present.

Award Recommended :—

Award of Merit.

To *Rhododendron* × 'Tessa' (votes 6 for, 1 against), from J. B. Stevenson, Esq., Tower Court, Ascot. See p. 176.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. J. M. BRIDGEFORD in the Chair, and eight other members present.

Exhibits.

The Royal Farnham Nurseries, Slough : Carnations 'Joyce' (*Spectrum* × 'Topsy') and 'Vera' (*Spectrum* × 'Eileen Low'), to be seen again.

DONATIONS TO THE SOCIETY'S GARDENS, 1934 (cont.).

DURHAM, Col. F. R., R.H.S.; Seeds of *Astragalus Durhamii*. EDINBURGH ROYAL BOTANIC GARDEN; Collections of plants, seeds, and cuttings. ELLIOTT, C., Stevenage; Plants of *Fuchsia macrostemma alba*, F. 'Mrs. Poppo.' ENGELMANN, C., Saffron Walden; Seed of Pansy 'Engelmann's Special.' ERSKINE, Capt. GORE, W. Abyssinia; Seeds of *Commelina* sp.? FALCONER, A., Stalybridge; Plants of *Meconopsis betonicifolia*. FARMER, —, Loxwood; Plants from Uganda. FENWICK, G., Stamford; Seed of *Anemone Pulsatilla*; plant of *Iris ruthenica*. FENWICK, M., Stow-on-the-Wold; Collection of plants; cuttings of *Lonicera tragophylla* and *Campanula mirabilis*. FITT, F. W., Tavistock; Plants of *Dracocephalum Isabellae*. FREIBURG UNIVERSITY BOTANIC GARDEN, Baden; Seeds of *Campanula thyrsoidea*, *C. Moretiana* and *Dianthus glacialis*. FRIKART, C., Zurich; Collection of seeds. FUNGE, J. W.; Seed of *Cladrastis* sp., and yellow-flowering tree. GALSWORTHY, F., Chertsey; Collection of Iris seeds. GARDNER, the Hon. Mrs. A., Worplesdon; Seed of *Thiadiantha Oliveri*, female form, and tuber of same form. GLASNEVIN BOTANIC GARDEN, Dublin; Collections of seeds and plants. GODMAN, Dame ALICE, Horsham; Seeds of *Salvia bicolor*. GÖTEBORG BOTANIC GARDEN, Sweden; Collection of seeds. GOULD, G. W., Nottingham; Collection of seeds of alpine plants. GOULD, N. K., West Byfleet; Cuttings of *Corokia virgata*. GRANT, T., Stamford; Apple 'Martin Cecil.' HANBURY, C., La Mortola; Collection of seeds. HARLEY, A., Kirkcaldy; Seeds of Gentian, *Meconopsis* and *Nomocharis*. HARRIS, H., Putney; Seeds of *Doryanthus Palmieri*, *Gardenia Thunbergiana*. HAWKER, Capt. H. G., Ermington; Plants of *Delphinium Welbyi*. HAY, T., Hyde Park; Seeds of *Gentiana argentea*, *Primula eburnea*, *P. Kingii*; Collection of plants. HERKLOTS, G. A. C., University of Hong Kong; Collection of seeds. HEWITT, Messrs., Solihull; Plants of *Thalictrum dipterocarpum*, Hewitt's Double. HILLING, Messrs. T., Chobham; Collection of Conifers and other plants. HILLIER & SONS, Messrs., Winchester; Plant of *Sollya Drummondii*. HOKKAIDO IMPERIAL UNIVERSITY BOTANIC GARDEN, Japan; Collection of seeds. HOULT, J. M., Lincoln; Seed of *Cytisus* × *Adami*. HUBBARD, T., Bletchley; Plant of Tree Pæony. IMPEY, L. A., Oxfordshire; Bulbs of *Tulipa cretica*, *Fritillaria graeca*. INGWERSEN, W. E. T., E. Grinstead; Collection of seeds; plants of *Leucojum autumnale*, *Sempervivella alba*, *Gilia pungens*. JEFFERIES & SON, Messrs. J., Cirencester; trees of Apple 'Siddington Russet.' JEVYLL, F., Godalming; Collections of seeds, bulbs and plants. JOHN INNES HORTICULTURAL INSTITUTION, Merton; Seeds of Antirrhinums; trees of seedling Apple, No. 1090. JOHNSON, A. T., Tal-y-Cafn; Plant of *Aster Porteri*. JOHNSTON, L., Hidcote Manor, Glos.; Collection of seeds. JONAS, A. C., Fordingbridge; Seed of *Paeonia lutea*. JONES, F., Lechlade; Seed of white and pink Nulumbium. JORDAN, Dr., per G. Fox Wilson; Seed of *Acacia hebecedada*. KEW, ROYAL BOTANIC GARDEN; Collection of seeds; plant of *Bougainvillea glabra* var. 'Louis Wachen,' for temperate house. KORNIK GARDENS and ARBORETUM, Poland; Collection of tree and shrub seeds. LADHAMS, Messrs. E., Elstead; Collection of herbaceous plants. LAUSANNE UNIVERSITY BOTANIC GARDEN; Seeds of *Helonias erythrosperma*, *Alyssum Borzaceanum*, *Atraphaxis Billardieri*. LAWRENCE, Lady, Dorking; Collection of cuttings and plants. LEMPERG, Dr. F., Steiermark, Austria; Collection of seeds. LENINGRAD BOTANIC GARDEN, U.S.S.R.; Collection of seeds. LEXINGTON BOTANIC GARDENS, U.S.A.; Seeds of Gentian and Lily species. LOFTHOUSE, T. A., Middlesbrough; Seedlings of *Campanula Bolosii*; collection of seeds. LONG, F. R., Port Elizabeth, S. Africa; Collection of seeds. LOWNDES, Capt. D. G., Ringwood; Collection of bulbs, plants and seeds. LYNCH, R., Dartington Hall, Totnes; Plant of *Berberidopsis corallina*. MACAULAY, R. H., Argyll; Plant of *Gentiana trichotoma*. MACSELF, A. J., Reading; Collection of ferns. MAFFEY, Lady D., King's Lynn; Seed of *Nepeta Browniae*. MAGOR, E. J. P., St. Tudy; Seedlings of *Crawfordia trinervis* and *Rhododendron haematodes* × *Thomsonii*. MARCHANT, W. J., Wimborne; Collection of Berberis and other shrubs. MARSHALL, Mrs., Oxford; Seed of *Digitalis ambigua* and *Oenothera odorata sulphurea*. MARSHALL, Mrs. C., Ambleside; Seed of *Davidia involucreata*. MESSEL, Lt.-Col. L. R. C., Handcross; Collection of plants. MILLARD, F. W., E. Grinstead; Collection of plants. MILLS, R., Iowa, U.S.A., per Col. DURHAM, Vincent Sq.; Plants of *Lilium michiganense*. MITCHELL, W. J., Tetbury; Collection of trees and shrubs. MITRA, N., Calcutta; Seed of *Rosa macrocarpa*.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

CHELSEA SHOW.

Fellows will find in this number a special circular which has been kindly supplied by the Royal Automobile Club giving the official traffic rules and parking places.

In view of the Silver Jubilee there is likely to be a considerable influx of visitors from overseas. Members of the Horticultural Society of Lombardy, Italy; of the Dendrological Society of Sweden, and representatives of numerous Garden Clubs of America are expected to be among the visitors.

Arrangements for the Admission of Fellows.

From 4 P.M. to 8 P.M. on Tuesday, May 21, Fellows will be admitted only on presentation of special admission cards which will be sent out about a fortnight before the Show. Fellows' passes and tickets will admit at any time when the Show is open on Wednesday, Thursday and Friday, May 22, 23, and 24 (*see tickets*). The Exhibition is not open to the public on Tuesday, May 21.

The public will be admitted on payment as follows:

	s.	d.
Wednesday, May 22, from 12 noon to 8 P.M.	10	0
Thursday, May 23, from 10 A.M. to 5 P.M.	5	0
" " " 5 P.M. to 8 P.M.	2	6
Friday, May 24, from 9 A.M. to 5 P.M.	2	6

Payments may be made before the Show at the Society's Offices, Vincent Square, Westminster, S.W. 1. During the Show they will be accepted at the entrances to the Show only.

Bath Chairs, self-propelled or invalid chairs cannot be admitted on Wednesday, May 22, but on Thursday and Friday, May 23 and 24, they will be admitted between the opening hour and 12 noon on payment of an extra 5s. for *one* attendant.

CONFERENCES.

Conference on Daffodils.

The Conference on Daffodils was successfully held on Tuesday, April 16 to Thursday, April 18, and it was well attended. The report of the Conference, giving the papers and discussions *in extenso*, together with illustrations, will appear in the autumn in the Daffodil Year Book for 1935.

Conference on Cherries and Soft Fruits.

The Cherry and Soft Fruit Conference will be held on July 16 and 17, 1935, in the Lecture Room of the New Hall, Greycoat Street, S.W. 1. On this occasion, besides the usual Fortnightly Meeting there will be a Special Fruit Competition for Amateurs in the New Hall, the schedule for which is obtainable from the Secretary. In the Old Hall, the Kent Branch of the National Farmers' Union will stage their annual show of Cherries and Soft Fruits.

Programme of Conference.

TUESDAY, APRIL 16, AFTERNOON, 3-5.

Lord ABERCONWAY, C.B.E., V.M.H., President of the Royal Horticultural Society in the Chair, supported by Mr. E. A. BUNYARD, F.L.S., V.M.H., Chairman of the Soft Fruit Conference Committee.

- (i) "Cherries for Market Growing Purposes," by Mr. L. DOUBLEDAY, followed by Mr. E. A. BUNYARD and Mr. BRIDGES DIXON.
- (ii) "Growing Healthy Strawberries," by Mr. RONALD VINSON, followed by Dr. SWARBRICK, Mr. A. M. MASSEE, Mr. C. H. OLDHAM and Mr. T. R. C. BLOFELD.

WEDNESDAY, JULY 17, MORNING SESSION, 11 A.M.-1 P.M.

Mr. H. V. TAYLOR, O.B.E., B.Sc., A.R.C.S., Commissioner of Horticulture, Ministry of Agriculture and Fisheries, in the Chair.

- (i) "Nutrition and Manuring of Soft Fruits," by Dr. T. WALLACE, followed by Mr. H. GOUDE and Mr. C. D. CARTER.
- (ii) "Growing Healthy Raspberries," by Mr. R. V. HARRIS, followed by Mr. J. MCINTYRE, Mr. G. C. JOHNSON and Mr. G. C. MUNDAY.

WEDNESDAY, JULY 17, AFTERNOON SESSION, 3-5.

Sir WILLIAM G. LOBJOIT, O.B.E., J.P., V.M.H., Chairman of the Fruit and Vegetable Committee of the National Farmers' Union, in the Chair.

- (i) "Soft Fruits for the Private Garden," by Mr. A. N. RAWES, followed by Mr. R. H. HALL and Mr. T. E. TOMALIN.
- (ii) "Blackberries and like Berries for Garden Purposes," by Mr. M. B. CRANE, followed by Miss A. B. BEAKBANE.
- (iii) "The Bottling of Soft Fruits."

The following additional papers will be published in the Report :

- "Varieties of Cherries," by Mr. E. A. BUNYARD.
 "Soft Fruits: Varieties under Trial at Wisley," by Mr. A. N. RAWES.
 "Varieties of Fruits for Canning," by Mr. W. B. ADAM.
 "Gooseberries for Market," by Mr. H. C. SELBY.

The Secretary would be pleased to hear of any Fellows who desire to attend.

Conference on Alpine Plants, 1936.

The preliminary programme for a Conference on Alpine Plants to be held in May next year is now settled.

The Conference will be spread over three days. The first afternoon, May 5, is to be devoted to two subjects: "Rock Gardening of Different Periods in Different Countries" and "The Rise of Modern Rock Gardening and its Future." The subjects on May 6 will be "Utilization of Natural Slopes" and "Utilization of Flat Sites," and "Cultivation of Rock Plants in General" and "Cultivation of Difficult Plants." On May 7 discussions will take place on "The Alpine House" and "Propagation."

All Fellows interested in this Conference are asked to notify the Secretary.

International Conferences.

During the autumn of this year two International Conferences are to take place. The first, the International Botanical Congress at Amsterdam, on September 2-7; the second, the International Horticultural Congress at Rome, on September 16-21. Fellows desiring particulars of these two Conferences are asked to apply to the Secretary.

CALENDAR.

May 8, 1-7.30 P.M., and May 9, 10 A.M. to 5 P.M.—Fortnightly Meeting. This fortnightly meeting commences on a Wednesday, in view of the Silver Jubilee Celebrations. Spring flowers and forced shrubs may be expected.

In the Lecture Room of the New Hall at 3.30 P.M. on May 8 Lady ROCKLEY will speak on "The Wild Flowers of the Dominions." The Lecture will be illustrated by lantern slides.

At 4.30 in the afternoon of May 8, in the Restaurant of the Old Hall, the Lily Group will meet, and the "Cultivation of Lilies in Pots" will be discussed.

May 21-24.—Chelsea Show in the Royal Hospital Grounds, Chelsea. Full particulars of the arrangements for this Show will be found in the first paragraph of these notes (p. lxv).

June 4, 1-7.30 P.M., and June 5, 10 A.M. to 5 P.M.—Fortnightly Meeting. At this, the first Show after the Chelsea Show, herbaceous plants are likely to be to the fore, but it is a little difficult to prophesy, owing to the curious season we have had this year.

In the Lecture Room of the New Hall at 3.30 P.M. on June 4 Mr. R. C. and Mr. R. F. NORCUTT will lecture on "The Best Japanese Cherries for an English Garden."

At 3.30 P.M. on June 5 in the Lecture Room there will be a lecture arranged by the Institute of Landscape Architects on "Pruning and Care of Trees and Shrubs," to be given by Mr. E. CHEAL. All Fellows will be admitted to this lecture.

June 6, 1-7.30, and June 7, 10 A.M. to 5 P.M.—Iris Society's Show. On this occasion a special exhibit will be staged from Wisley in illustration of "Iris Diseases."

On June 6 the Joint Iris Committee meets at 2.15 P.M.

On June 14 and June 17-21 the Teachers' Advanced Practical Examination and the National Diploma in Horticulture Preliminary Practical Examination will be held at Wisley.

June 18, 1-7.30 P.M., and June 19, 10 A.M. to 5 P.M.—Fortnightly Meeting. Roses and Delphiniums are likely to be shown in quantity. There will be a competition for the Sewell Medal for Alpines at this meeting, the regulations for which will be found in the January JOURNAL, p. 30, paragraph 13.

At this meeting the London and South of England Viola and Pansy Society will stage their exhibits.

In the Lecture Room of the New Hall, at 3.30 P.M. on June 18, Mr. C. T. MUSGRAVE will lecture on "Gentians."

In the afternoon of June 18, at 4.30, in the Restaurant of the Old Hall the Lily Group will meet to discuss "Californian Lilies."

Intending exhibitors for the Amateur Show are reminded that June 18 is the closing date for entries. Schedules may be had on application to the Secretary.

June 25, 1-7.0 P.M.—Amateur Flower Show. On this occasion there will be a special exhibit from Wisley of Pests and Diseases of Garden Plants.

June 25-28.—National Diploma in Horticulture Final Practical Examination will be held at Wisley.

June 27, 1-7.30 P.M.—British Delphinium Society's Show. The Joint Delphinium Committee meets at 12.15 P.M.

ADDITIONS AND ALTERATIONS TO CALENDAR.

Lectures.

An additional lecture has been arranged and will take place on July 30 in the Lecture Room of the New Hall at 3.30 P.M. Mr. F. R. LONG, Associate of Honour of this Society, and President of the Association of Superintendents of Parks and Gardens, South Africa, will be in England and has offered to lecture to the Society on the South African flora. The lecture will be illustrated by lantern slides, and will give a description of the Port Elizabeth parks and open spaces, as well as some notes on the succulent plants of South Africa. Will Fellows kindly make a note in their diaries to this effect?

Cancellation of National Sweet Pea Society's Show.

The National Sweet Pea Society's Show which appears in the Calendar for July 5 is cancelled, and the Show is now to be held at Hastings, in the Alexandra Park, on July 3 and 4. All interested in this show should write to Mr. A. C. BARTLETT, Secretary of the National Sweet Pea Society, 19 Bedford Chambers, London, W.C. 2.

SILVER JUBILEE MEDAL.

For Affiliated Societies.

In commemoration of Their Majesties Silver Jubilee, the Council has decided to offer to Affiliated Societies a specially designed Silver Medal in place of the Banksian Medal, which is usually presented by Affiliated Societies as the premier

award at their shows. The conditions under which this medal will be presented may be obtained on application to the Secretary, when a copy of last year's schedule of the Affiliated Society should be forwarded.

LUPINS AT COBHAM HALL, KENT.

Readers of Lord DARNLEY's interesting account of Lupins in our JOURNAL for April (p. 151) will be glad to know that the gardens at Cobham Hall will be open to the public on payment of 1s. on Wednesday, Thursday, Saturday and Sunday from 2 to 7 P.M. every week till the end of September. The Lupins are likely to be at their best from mid-May to mid-June.

WISLEY GARDENS.

Additional Demonstration at Wisley Gardens.

An additional demonstration has been arranged for Wednesday and Thursday August 28 and 29, 1935, on "Propagation of Plants." Fellows intending to be present on this occasion should notify the Director beforehand so that adequate arrangements can be made.

The Garden.

One of the most attractive parts of the Garden at this season is Seven Acres, for there are more shrubs and small trees flowering now than at any other part of the year. The Lilacs and other shrubs in Howard's Field (where is one of the largest collections of Lilacs in existence) are likely to be at their best. In the Wild Garden Primulas and Azaleas will be a feature, and many Rhododendrons are likely to be in bloom. The rock garden and the alpine house will also be full of flowering plants.

Calceolarias, Fuchsias and the trial of Cornflowers in pots in the plant house and the uncommon tender plants in the temperate houses will be the principal things to be seen under glass.

The Gardens are now open on Sundays from 2 to 6 P.M. to those presenting Fellows' tickets only.

White Fly Parasite.

The parasite of the greenhouse white fly, *Encarsia formosa*, has proved extremely effective in checking the increase of this pest under glass where it has been introduced, and large numbers have been distributed during the past few years. The demand has become so great that in order to meet in a measure the cost of maintaining the parasite over the difficult winter months and packing and despatching it, the Council has fixed a charge of 2s. 6d. for a supply for a small house and 5s. for a large house, and applications for it should be accompanied by the sum named. It is useless to introduce it to houses until the average temperature is about 70° F. Early application should be made since the supply is limited, and it is hoped that Fellows who have found it successful will distribute it in their neighbourhood.

Trial of Spraying Machines for Liquids for Gardens, Orchards and Fields.

A Trial of all types of apparatus for liquid spraying (but not including spray guns) is being arranged and will take place on Friday, July 12, 1935.

The Trial will cover apparatus suitable for the following classes of work :

- (a) Hand-work in small gardens—i.e. syringes of all types, continuous-pumping and pneumatic sprayers and diffusers, bucket and similar light sprayers.
- (b) Large gardens, market gardens, bush-fruit plantations and large glass-houses—i.e. continuous-pumping and pneumatic knapsack sprayers, barrel and tank sprayers and headland sprayers.
- (c) Fruit farms and large market gardens—i.e. power sprayers for wet spraying.

In judging the machines their suitability for use with the following will be taken into account :

- (a) Nicotine and similar washes, including soap and oil emulsions.
- (b) Bordeaux mixture.
- (c) Arsenical washes in suspension—lead arsenate.
- (d) Caustic winter washes.
- (e) Tar-oil washes.
- (f) Lime-sulphur washes.
- (g) Acid washes.

Other considerations will be :

General Construction.

- (a) Simplicity and accessibility of parts, particularly pump and valves.
- (b) Ease of working.
- (c) Ease of repair and replacement of valves, washers, pump packing, etc.
- (d) Agitating devices.
- (e) Durability.
- (f) Power.
- (g) Portability or ease of traction.

Nozzles.

- (a) Fineness of spray, penetration and covering power.
- (b) Simplicity of construction.
- (c) Ease of clearing choked nozzles.

Cost of apparatus, accessories and spare parts.

Fellows desiring to be present at the Trials and to see the working of the apparatus, please notify the Secretary beforehand.

GENERAL MEETING.

MARCH 5, 1935.

Mr. W. HALES, A.L.S., in the Chair.

A lecture on "Plants for the Small Greenhouse" was given by Mr. E. R. LUCKHURST.

SCIENTIFIC COMMITTEE.—Mr E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and six other members present.

Myginda disticha.—Dr. Tincker showed *Myginda disticha* from Wisley. This plant was grown from seed collected by Comber under No. 448 on his Andean expedition. He reported it as bearing masses of yellow and scarlet fruits when growing exposed to light but occurring also in moist woods. It belongs to the Celastraceae and was described by Hooker in *Flora Antarctica* II, p. 254.

Primula juliae with *folioso calyx*.—Mr. Chittenden showed *Primula juliae* with a *folioso calyx* similar to that frequently seen in the common primrose, and *Tulip* with *perianth and cauline leaf adherent*, the latter appearing as though partially coloured.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and thirteen other members present.

The only business before the Committee was identification of fruits.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Sutton, Reading, for *Cinerarias*.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for *Carnations*.

To Mr. G. H. Dalrymple, Bartley, for *Freesias*.

To Messrs. Wakeley, London, for *Hyacinths*.

Flora Medal.

To Messrs. Prins, Wisbech, for *Hyacinths, Tulips and Daffodils*.

Banksian Medal.

To Army Vocational Centre, Chisleton, for *Cinerarias*.

To Ashington (Sussex) Nurseries, Ashington, for *Carnations*.

To Messrs. Engelmann, Saffron Walden, for *Carnations, Echeveria retusa hybrida*, etc.

Selected for trial at Wisley.

Cineraria 'Superb Large Flowered Single Strain,' from Messrs. Sutton, Reading.

Nasturtium 'Primrose Gleam,' from Mr. E. J. Barker, Ipswich.

Other Exhibits.

Misses Allen-Brown, Henfield : *Violets*.

Messrs. Blackmore & Langdon, Bath : *Blue Primroses and Polyanthus*.

Miss E. Heathcote, Williton : *Violets*.

Mr. H. G. Longford, Abingdon : *Lachenalia* 'Nobility.'

Messrs. S. Low, Enfield : *Carnations*.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Casburn, Bedford & Page, Trumpington, for *Saxifrages* and other alpine plants.

To Messrs. Waterer, Sons & Crisp, Bagshot, for *flowering shrubs*.

Silver Flora Medal.

To Messrs. Cheal, Crawley, for *flowering shrubs*.

To Messrs. C. Elliott, Stevenage, for *alpine plants*.

To Messrs. L. R. Russell, Richmond, for *flowering shrubs*.

Silver Banksian Medal.

To Brookside Nurseries, Oxford, for Saxifrages.

To Mr. G. E. Welch, Cambridge, for Saxifrages and other alpine plants.

Flora Medal.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Hocker Edge Gardens, Cranbrook, for bulbous plants in pans.

To Messrs. M. Prichard, Christchurch, for alpine and bulbous plants.

Banksian Medal.

To Alpine Nurseries, West Moors, for alpine plants.

To Messrs. Barr, Covent Garden, for Narcissi and other bulbous plants.

To Messrs. Stuart Low, Enfield, for greenhouse shrubs.

To Messrs. D. Stewart, Ferndown, for alpine plants and shrubs.

To Messrs. Waterer, Sons & Crisp, Twyford, for alpine and bulbous plants.

Award of Merit.

To *Clematis macropetala* Markham's Pink as a hardy flowering shrub (votes 20 for), from Wm. Robinson, Esq., East Grinstead. See p. 175.

To *Gladiolus gracilis* as a flowering plant for the cold house (votes 17 for), from T. T. Barnard, Esq., Wareham. See p. 176.

To *Prunus Conradinae semi-plena* as a hardy flowering tree (votes unanimous), from Mr. R. C. Notcutt, Woodbridge. See p. 176.

Other Exhibits.

Messrs. Baker, Codsall : flowering shrubs and alpine plants.

T. T. Barnard, Esq., Wareham : *Petamenes abbreviata*.

Messrs. Blackmore & Langdon, Bath : *Delphinium Welbyi*.

Mr. H. S. Boothman, Maidenhead : alpine plants.

Messrs. Burkwood & Skipwith, Kingston-on-Thames : flowering shrubs.

Chez Nous Nurseries, Newick : alpine plants.

Messrs. B. Gill, Falmouth : Rhododendrons.

Messrs. Hillier, Winchester : *Ilex cornuta*.

Miss Hopkins, Coulsdon : hardy plants.

G. H. Johnstone, Esq., Trewithen : *Gordonia axillaris*.

Mr. R. Kaye, Silverdale : alpine plants.

Letchworth Plants, Ltd., Letchworth : alpine plants.

Mr. H. G. Longford, Abingdon : *Lachenalia*.

Marsden Nurseries, Ashted : hardy plants.

Messrs. Maxwell & Beale, Broadstone : alpine plants and shrubs.

Owermoigne Nurseries, Dorchester : alpine plants and shrubs.

Mrs. Price, Godalming : *Veltheimia viridifolia*.

Lionel de Rothschild, Esq., Exbury : *Gentiana gilvostriata*.

Messrs. W. H. Rogers, Southampton : alpine plants and shrubs.

Messrs. L. R. Russell, Richmond : *Medinilla* sp.?, *Tritonia crocata*.

Sandon Nurseries, Chelmsford : alpine plants.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and sixteen other members present.

Awards Recommended :—**Gold Medal.**

To Messrs. H. G. Alexander, Tetbury, for a group.

Silver-gilt Banksian Medal.

To Sir William Cooke, Bt., Hampstead Norris, Berks, for a group.

To Messrs. McBean, Cooksbridge, for a group.

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for a group.

To Messrs. Charlesworth, Haywards Heath, for a group.

Banksian Medal.

To Messrs. Black & Flory, Slough, for a group.

To G. P. Harben, Esq., King's Somborne, for Cymbidiums.

To Messrs. Stuart Low, Jarvis Brook, for a group.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.

Award of Merit.

To *Cymbidium* × 'Corisande' (*insigne* × 'Rosanna') (votes unanimous), from Lionel de Rothschild, Esq., Exbury. See p. 175.

To *Cymbidium* × 'Aphrodite' ('Flamingo' × 'Redstart') (votes 12 for), from E. Kenneth Wilson, "Cannizaro," Wimbledon. See p. 175.

To *Cymbidium* × 'Jungfrau' var. 'Snow Queen' (*Alexanderi* × 'Eagle') (votes unanimous), from Messrs. H. G. Alexander, Tetbury. See p. 175.

To *Cymbidium* × 'Eve' ('Rosanna' × 'Flamingo') (votes 12 for, 1 against), from Messrs. H. G. Alexander, Tetbury. See p. 175.

To *Cymbidium* × 'Midas' var. 'Opal' (*Pauwelsii* × 'Miranda') (votes unanimous), from Messrs. McBean, Cooksbridge. See p. 175.

Cultural Commendation.

To Messrs. Sanders, St. Albans, for *Odontoglossum pulchellum*, with 21 flower-spikes.

Other Exhibit.

Messrs. Harry Dixon, Wandsworth : a group.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Flora Medal.

To Mr. R. F. Calvert, Coverack, Cornwall, for an exhibit of Daffodils.

Silver Banksian Medal.

To Mr. J. L. Richardson, Prospect House, Waterford, for an exhibit of Daffodils.

Floral Medal.

To Messrs. Barr, 12 King Street, Covent Garden, for group of Daffodils.

To Messrs. Carter's Tested Seeds, Raynes Park, for group of Tulips.

To Messrs. Dobbie, Edinburgh, for group of Double Tulips.

To Messrs. J. R. Pearson, Lowdham, for an exhibit of Daffodils in bowls.

Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Daffodils and Tulips.

Award of Merit.

To *Narcissus* 'Fortune's Sentinel' as a variety for show (votes 8 for, 0 against). Mr. R. F. Calvert, Coverack. See p. 222.

The following Awards were recommended after trial at Gulval :

First-class Certificate.

To *Narcissus* 'Forerunner.' See p. 222.

To *N.* 'Whiteley Gem.' See p. 223.

Award of Merit.

To *N.* 'Sulphur.' See p. 223.

To *N.* 'Boswin.' See p. 221.

To *N.* 'Messina.' See p. 222.

To *N.* 'Duncan.' See p. 222.

To *N.* 'Pepper.' See p. 223.

Highly Commended.

To *N.* 'Pentewan.' See p. 222.

To *N.* 'St. Martin.' See p. 223.

JOINT RHODODENDRON COMMITTEE.—Mr. W. J. BEAN in the Chair, and seven other members present.

Exhibit.

Rhododendron oreodoxa × *R. planetum*? from Lionel de Rothschild, Esq., Exbury, Hants.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. J. M. BRIDGEFORD in the Chair, and eight other members present.

Exhibits.

The Royal Gardens, Windsor : Perpetual Flowering Carnation 'Silver Jubilee' ('Rapture' × 'Mrs. A. J. Cobb'). To be seen again.

MARCH 19, 1935.

Dr. FRED STOKER, F.L.S., in the Chair.

A lecture was given by Dr. H. ROGER SMITH on "New Alpines."

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eight other members present.

Leguminous Plant from Rhodesia.—Mr. E. G. Baker showed a Leguminous plant allied to *Lotus* but apparently not agreeing with any species so far described from Rhodesia. The flowers were yellow and about 1½ inch long.

Fritillaria sp.—A species of *Fritillaria* was referred to the Committee from Floral Committee B. It had been purchased under the name of *F. coccinea*, but proved to be *F. Purdyi*, as Mr. Baker reported later.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and fifteen other members present.

Exhibits.

Miss H. Halestrap, Upminster : Seedling Apple.
Messrs. Laxton, Bedford : Apple 'Royalty.'
Mr. H. C. Gardiner, Claygate : Apple 'Murfitt's Seedling.'
Mr. E. A. Bunyard, Allington : Apples 'Sir John Thornycroft,' 'Grange's Pearmain,' and Pear 'Langstelige Bergamotte.'

FLORAL COMMITTEE A.—Mr. J. M. BRIDGEFORD in the Chair, and fifteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. G. H. Dalrymple, Bartley, for Freesias.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Wakeley, London, for Hyacinths.

Silver Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, Euphorbias and Echeverias.

Flora Medal.

To Mr. E. J. Hicks, Hurst, for Roses.

Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Polyanthus and Blue Primroses.

To Messrs. Blom, Cranleigh, for Hyacinths.

To Messrs. Carter, Raynes Park, for Cinerarias, Hyacinths and Crocuses.

The following award was recommended after trial at Wisley.

Highly Commended.

To *Primula malacoides* 'Sutton's Giant,' from Messrs. Sutton, Reading.
See p. 224

Selected for trial at Wisley.

Primula 'Rosedale,' from Lt.-Col. C. H. Grey, Cranbrook.

Other Exhibits.

Messrs. Gill, Falmouth : Anemones.

John Innes Horticultural Institution, Merton : *Primula* \times *hewensis*.

Messrs. S. Low, Enfield : Carnations.

Mrs. H. L. M. Tritton, Chelmsford : Cyclamen 'Mrs. G. Tritton.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Clarence Elliott, Stevenage, for Saxifrages, Primulas and other alpine plants.

To Messrs. J. Waterer, Sons & Crisp, Bagshot, for Japanese Cherries.

Silver Flora Medal.

To Messrs. Casburn, Bedford & Page, Trumpington, for alpine plants.

Silver Banksian Medal.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Mr. G. E. Welch, Cambridge, for Saxifrages and other alpine plants.

Flora Medal.

To Messrs. R. Gill, Falmouth, for Rhododendrons and Camellias.

To Hocker Edge Gardens, Cranbrook, for bulbous plants.

To Messrs. Stuart Low, Enfield, for greenhouse shrubs.

To Messrs. Neale, Newhaven, for succulents.

To Messrs. M. Prichard, Christchurch, for alpine plants.

Banksian Medal.

To Messrs. Baker, Codsall, for bulbous and alpine plants.

To Messrs. Barr, Taplow, for Narcissi and other bulbous plants.

To Dartington Hall Ltd., Totnes, for flowering shrubs.

To Messrs. L. R. Russell, Richmond, for flowering shrubs.

To Messrs. D. Stewart, Ferndown, for shrubs and alpine plants.

To Messrs. Waterer, Sons & Crisp, Twyford, for alpine plants.

To Messrs. W. Wells, jun., Merstham, for alpine plants.

First-class Certificate.

To *Leucocoryne irioides odorata* as a flowering plant for the cold house (votes 8 for, 1 against), from Messrs. Clarence Elliott, Ltd., Stevenage. See p. 221.

Award of Merit.

To *Cyclamen persicum* as a flowering plant for the cold house (votes 13 for), from Major F. C. Stern, Goring-by-Sea. See p. 220.

To *Erica australis* as a hardy flowering shrub (votes 12 for, 3 against), from Mr. John Heal, Budleigh Salterton. See p. 220.

To *Iris Winogradowii* as a hardy flowering plant (votes unanimous), from Major F. C. Stern, Goring-by-Sea. See p. 221.

Preliminary Commendation.

To *Douglasia dentata* as a flowering plant for the alpine house (votes 14 for), from Dr. Roger Bevan, Henley-on-Thames.

Other Exhibits.

Alpine Nurseries, Ltd., West Moors : alpine plants.

Miss C. Beck, Ware : *Fritillaria askhabadensis*, *F. recurva*, *F. Purdyi*.

Dr. Roger Bevan, Henley-on-Thames : *Primula Allionii*, Crowsley var.

Messrs. Burkwood & Skipwith, Kingston-on-Thames : flowering shrubs.

Messrs. Cheal, Crawley : flowering shrubs and alpine plants.

Chez Nous Nurseries, Newick : alpine plants.

Messrs. Clark, Dover : hardy plants.

Dorset Nurseries, Blandford : alpine plants.

Dame Alice Godman, D.B.E., Horsham : *Tecophilaea cyanocrocus*.

W. Balfour Gourlay, Esq., Cambridge : *Fritillaria glauco-viridis*.

Capt. H. G. Hawker, Ermington : *Cassia corymbosa* var. *stipulacea*.

Mr. John Heal, Budleigh Salterton : *Erica australis*, Round Hill var.

Miss Hopkins, Coulsdon : hardy plants.

Iris Lady Lawrence, Dorking : *Corydalis transylvanica* var. *salmonica*.

Messrs. Maxwell & Beale, Broadstone : alpine plants.

Mrs. R. L. Newman, Dartmouth : *Acacia longifolia*, *Iris tingitana*, *Arctotis* sp.

Viscountess St. Cyres, Lymington : *Lachenalia Durnsii*.

Major F. C. Stern, Goring-by-Sea : *Helleborus orientalis* 'Red Spur.'

Mr. G. Wood, Ashted : hardy plants.

ORCHID COMMITTEE.—F. J. HANBURY, Esq., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To F. J. Hanbury, Esq., East Grinstead, for a group.

To Messrs. McBean, Cooksbridge, for a group.

To Messrs. Charlesworth, Haywards Heath, for a group.

To Messrs. Sanders, St. Albans, for a group.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.

Banksian Medal.

To Messrs. H. G. Alexander, Tetbury, for a group.

First-class Certificate.

To *Odontoglossum* × 'Alector' var. 'Monaco' ('Amabilicity' × *crispum*) (votes 11 for), from M. L. Wells, Esq., Chiddingfold, Surrey.

Award of Merit.

To *Cymbidium* × 'Lyoth' var. 'Rosy Morn' ('Ceres' × *insigne*) (votes 9 for, 4 against), from Messrs. Stuart Low, Jarvis Brook. See p. 220.

To *Cattleya* × 'Titrianae,' Old Dog Kennel var. ('Tityus' × *Trianae*) (votes 9 for, 1 against), from M. L. Wells, Esq., Chiddingfold, Surrey. See p. 220.

To *Cymbidium* × 'Madonna' var. 'N. Prinsep' (*Alexanderi* × 'Memoria P. W. Janssen') (votes 10 for, 5 against), from N. Prinsep, Esq., The Boxes, Pevensey Bay, Sussex. See p. 220.

To *Cymbidium* × 'Adelma' var. 'Springtime' ('Letty' × *Lowio-grandiflorum*) (votes 11 for), from Lionel de Rothschild, Esq., Exbury. See p. 220.

To *Cymbidium* × 'Susette' (*insigne* × 'Magali Surprise') (votes 12 for), from Messrs. McBean, Cooksbridge. See p. 220.

To *Cymbidium* × 'Eagle' var. 'Monarch' (*Alexanderi* × *Gottianum*) (votes 10 for), from Messrs. H. G. Alexander, Tetbury. See p. 220.

Cultural Commendation.

To Mr. E. V. Kent, Orchid grower to E. R. Ashton, Esq., Tunbridge Wells, for *Phaius* × *Marthae*, with 7 flower-spikes.

Other Exhibits.

Messrs. Black & Flory, Slough : a group.
 Messrs. Stuart Low, Jarvis Brook : a group.
 Messrs. H. Dixon & Sons, Wandsworth : a group.
 Sir Jeremiah Colman, Bt., Reigate : well-cultivated large specimen plants of *Coelogyne pulchella*, *Ada aurantiaca*, *Eria stellata* and *Epidendrum Endresii*.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended :—*Gold Medal.*

To Mr. J. L. Richardson, Prospect House, Waterford, for Daffodils.

Silver-gilt Banksian Medal.

To Lord Rendlesham, Bosloe, Mawnan, Falmouth, for Daffodils.

To Mr. R. F. Calvert, Coverack, Cornwall, for Daffodils.

Silver Flora Medal.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, for Daffodils.

Silver Banksian Medal.

To Messrs. Barr, 12 King Street, Covent Garden, for Daffodils.

To Messrs. The Donard Nursery Company, Newcastle, Co. Down, for Daffodils.

Award of Merit.

To *Narcissus* 'Poldhu' as a show flower (votes unanimous) from Mr. R. F. Calvert, Coverack. See p. 223.

Variety Selected for Trial.

Narcissus 'Idwal' (Division 1a) shown by Mr. W. A. Watts, The Welsh Bulb Fields, St. Asaph, was selected for trial at Kirton.

Other Exhibits.

Sir Daniel Hall showed *Tulipa Staffii*, Lady Rockley's var. from Irak, *T. chrysantha* from Chitral, *T. Micheliana* and *T. cypria*. Sir Daniel having drawn attention to their peculiarities was thanked by the Chairman and asked to write notes upon them for the JOURNAL (see p. 218).

JOINT RHODODENDRON COMMITTEE.—Lt.-Col. STEPHENSON R. CLARKE in the Chair and seven other members present.

Award Recommended :—*Award of Merit.*

To *Rhododendron Cubittii* (votes unanimous) from Lt.-Col. E. H. W. Bolitho, Trengwainton, Heamoor, Penzance. See p. 224.

Other Exhibits.

E. Kenneth Wilson, Esq., Wimbledon : *R. luteo-roseum* × *R.* × 'Monarch.'
 Lady Loder, Leonardslee, Horsham : *R.* × 'Judy' (*R. pachytrichum* × *R. Falconeri*).

Lt.-Col. Messel, O.B.E., Nymans, Handcross, Sussex : *R. sperabile* (Forrest 26442).

Messrs. W. C. Slocock, Woking : *R. sp.* ? (series *Azalea*, sub-series *obtusum*).

GENERAL MEETING.

APRIL 2, 1935.

Lieut.-Colonel HERVEY GREY in the Chair.

A lecture was given by Professor T. T. BARNARD on "Cape Bulbs."

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and five other members present.

Narcissus aberrations.—Mr. Gould sent flowers of the variety 'Nero' from Wisley, where this *Narcissus* shows about 50 per cent. abnormal flowers this year. Abnormalities are found annually and they are not due to sterilizing, for the bulbs have not been heated for at least five years. The abnormalities consist of various degrees of fasciation in different parts of the flower stalk and flower, in multiplication of bracts, in malformations of the corona and sometimes enations therefrom, and in various adhesions and cohesions among the floral members.

Inducing variation in Potatoes.—Mr. Crane drew attention to reports from Russia of inducing variations in potatoes by the removal of buds to the depth of

about $\frac{1}{2}$ inch. Adventitious buds arise which are said to produce variants upon the original form.

Arum Dioscoridis spectabile.—This plant, shown by L. de Rothschild, Esq., and remitted from Floral Committee B, was unanimously recommended for a Botanical Certificate.

Plants for naming from Floral Committee B were referred to Kew, etc.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Exhibits.

Commercial Fruit Trials, R.H.S. Gardens, Wisley: Apples 'Encore,' and 'Laxton's Superb.'

Specimens of Apples, Pears and Plums from the Exhibit of South African Fruits in season staged by the Imperial Fruit Show, Ltd.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

Silver Banksian Medal.

To Messrs. Blom, Cranleigh, for Hyacinths.

To Mr. G. H. Dalrymple, Bartley, for Freesias.

To Messrs. Engelmann, Saffron Walden, for Carnations, Echeverias and Euphorbias.

Banksian Medal.

To Mr. H. G. Longford, Abingdon, for Polyanthus, Daffodils, etc.

Selected for trial at Wisley.

Nasturtium 'Wallflower Gleam,' from Mr. E. J. Barker, Ipswich.

Primrose (Double Blue) 'Mrs. E. C. Buxton,' from Captain E. H. Buxton, Saxmundham.

Other Exhibits.

Captain E. H. Buxton, Saxmundham: Anemone 'Fritton Hall Strain.'

Messrs. Clark, Dover: Blue Primroses, etc.

Messrs. John & A. H. Crook, Beaconsfield: Polyanthus.

Dean Gardens, Longniddry: Polyanthus and Double Primroses.

Mrs. E. Lloyd Edwards, Trevor: Primula 'Kinlough Beauty.'

Messrs. Low, Enfield: Carnations.

Messrs. Toogood, Southampton: Cinerarias.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. J. Waterer, Sons & Crisp, Bagshot, for flowering shrubs.

Silver Banksian Medal.

To Messrs. Stuart Low, Enfield, for greenhouse shrubs.

Flora Medal.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Hocker Edge Gardens, Cranbrook, for bulbous plants in pans.

To Mr. W. J. Marchant, Wimborne, for flowering shrubs and Shortias.

To Messrs. Neale, Newhaven, for succulents.

To Messrs. Reuthe, Keston, for flowering shrubs and alpine plants.

To Mr. G. E. Welch, Cambridge, for alpine plants.

Banksian Medal.

To Messrs. Barr, Taplow, for bulbous plants.

To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for shrubs.

To Messrs. Cheal, Crawley, for alpine plants.

To Messrs. Prichard, Christchurch, for alpine plants.

To Messrs. Russell, Richmond, for Gardenias and Camellias.

First-Class Certificate.

To *Forsythia intermedia spectabilis* as a hardy flowering shrub (votes unanimous), from Mark Fenwick, Esq., Stow-on-the-Wold. See p. 221.

To *Magnolia Sargentiana* as a hardy flowering tree (votes 16 for, 2 against), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. See p. 221.

To *Shortia uniflora grandiflora* as a hardy flowering plant (votes unanimous), from Mr. W. J. Marchant, Wimborne. See p. 225.

Award of Merit.

To *Iris basaltica* as a tender flowering plant (votes unanimous), from Mrs. Tracy, Wimborne. See p. 221.

To *Kalanchoe Blossfeldiana* as a flowering plant for the greenhouse (votes unanimous), from Messrs. Clarence Elliott, Stevenage. See p. 221.

To *Paeonia Cambessedesii* as a hardy flowering plant (votes 11 for, 5 against), from G. P. Baker, Esq., Sevenoaks. See p. 224.

To *Primula marginata* as a flowering plant for the rock garden and alpine house (votes unanimous), from Sir Oscar Warburg, Headley, Epsom. See p. 224.

To *Tritonia undulata* as a flowering plant for the cool house (votes 15 for), from T. T. Barnard, Esq., Wareham. See p. 225.

Preliminary Commendation.

To *Paraniha* sp. as a flowering plant for the cool house (votes 11 for, 4 against), from W. Bentley, Esq., Newbury.

Cultural Commendation.

To Mr. W. J. Marchant, Stapehill, Wimborne, for a magnificent plant of *Shortia uniflora grandiflora*.

To Miss I. Blaikie, Copthorne, for a pan of *Soldanella montana*.

Other Exhibits.

Lord Aberconway, Bodnant : *Schizocodon macrophyllus*.

Messrs. Baker, Codsall : shrubs.

G. P. Baker, Esq., Sevenoaks : *Edgeworthia papyrifera*.

F. Barker, Esq., Stevenage : *Primula* × *mirabilis*, *P.* × *Griffii*.

T. T. Barnard, Esq., Wareham : *Moraea villosa*, *Gladiolus* sp.

W. Bentley, Esq., Newbury : *Draba polytricha*.

The Curator, Chelsea Physic Garden, London : *Arisaema ringens*.

Dorset Nurseries, Blandford : shrubs and rock plants.

W. Balfour Gourlay, Esq., Cambridge : *Calceolaria picta*.

Mr. A. Hansen, New Barnet : *Sempervivum* 'Jubilee.'

Miss Hopkins, Coulsdon : rock plants.

Edward Howarth, Esq., C.B.E., Kirdford : *Teucrium fruticans*.

Mr. A. Kench, Weybridge : alpine plants.

Iris Lady Lawrence, Dorking : *Acacia hastulata*.

Lady Leconfield, Petworth : *Clematis aristata*.

Messrs. Maxwell & Beale, Broadstone : alpine plants and shrubs.

Capt. G. K. Mooney, Sevenoaks : *Primula* 'Garryard.'

Messrs. Redgrove & Patrick, Sevenoaks : shrubs.

Mr. J. Robinson, New Eltham : rock plants.

Messrs. Rogers, Southampton : alpine plants and shrubs.

Lionel de Rothschild, Esq., Exbury : *Arum Dioscoridis* var. *spectabile*.

Lady Beatrice Stanley, Market Harborough : *Pulsatilla* sp. *Hippeastrum* × *Carnarvon*.

Messrs. D. Stewart, Ferndown : rock plants and shrubs.

Ingham Whitaker, Esq., Lymington : *Berberis nepalensis*.

Mr. G. Wood, Ashted : hardy plants.

Mr. R. Colpoyes Wood, West Drayton : Conifers.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and seventeen other members present.

*Awards Recommended :—**Silver Banksian Medal.*

To Messrs. H. G. Alexander, Tetbury, for a group.

To Messrs. McBean, Cooksbridge, for a group.

To Messrs. Charlesworth, Haywards Heath, for a group.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.

Banksian Medal.

To Messrs. Stuart Low, Jarvis Brook, for a group.

To Messrs. Sanders, St. Albans, for a group.

To Messrs. H. Dixon, Wandsworth, for a group.

First-class Certificate.

To *Odontoglossum crispum* var. 'Celia Neilson' (votes 11 for), from N. Prinsep, Esq., The Boxes, Pevensey Bay.

Award of Merit.

To *Cymbidium* × 'Madonna' var. 'Snowdrift' (*Alexanderi* × 'Memoria P. W. Janssen') (votes 13 for), from N. Prinsep, Esq., The Boxes, Pevensey Bay. See p. 220.

lxxviii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

To *Cymbidium* × 'Louis Sander,' Exbury var. (*Alexanderi* × 'Ceres') (unanimous), from Lionel de Rothschild, Esq., Exbury. See p. 220.

To *Cymbidium* × 'Swallow' var. 'Phantasy' (*Alexanderi* × *Pauwelsii*) (votes 11 for), from Lionel de Rothschild, Esq. See p. 220.

Cultural Commendation.

To Messrs. McBean, Cooksbridge, for *Cymbidium* × 'Ceres' var. 'F. J. Hanbury.'

Other Exhibit.

Lord Aberconway, Bodnant, Tal-y-Cafn: *Cypripedium* × 'Niavius' ('Florence Spencer' × 'Psyche').

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Gold Medal.

To Mr. J. L. Richardson, Prospect House, Waterford, for an exhibit of Daffodils.

Silver Flora Medal.

To Mr. R. F. Calvert, Coverack, Cornwall, for an exhibit of Daffodils.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, for an exhibit of Daffodils.

Silver Banksian Medal.

To Messrs. Barr, 12 King Street, Covent Garden, for an exhibit of Daffodils.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Daffodils.

Award of Merit.

To *Narcissus* 'Trenoon' as a show flower (votes unanimous), from Mr. J. L. Richardson. See p. 223.

To *Narcissus* 'Caerleon' as a show flower (votes unanimous), from Mr. J. L. Richardson. See p. 222.

Selected for trial at Wisley.

Narcissus 'Miss Natty,' as a variety for the rock garden, from E. H. C. Thurston, Esq.

Narcissus 'Lord Kenyon,' *N.* 'Junket,' and *N.* 'Bryn Ellen,' as varieties for garden decoration, from Mr. W. A. Watts, The Welsh Bulb Fields, St. Asaph.

Selected for trial at Kirton.

Narcissus 'Lord Kenyon' and *N.* 'Cruiser,' as varieties for cutting from the open for market, from Mr. W. A. Watts.

Narcissus 'Feu de Joie,' as a variety for cutting from the open for market, from Messrs. R. H. Bath.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and thirteen other members present.

Awards Recommended :—

First-class Certificate.

Rhododendron taronense (votes 8 for, 3 against), from Lionel de Rothschild, Esq., Exbury, Hants. See p. 225.

Award of Merit.

Rhododendron × *valaspis* (votes 7 for, 3 against), from Lord Aberconway, Bodnant, N. Wales. See p. 225.

Rhododendron × *euchelia* (votes 10 for), from Lord Aberconway. See p. 224.

Rhododendron × 'Alix' (votes unanimous), from Lionel de Rothschild, Esq., See p. 224.

Other Exhibits.

R. E. Horsfall Esq., Farnham, Surrey: *Rhododendron* 'Littleworth.'
Mountiford Longfield, Esq., Penryn, Cornwall: *Rhododendron* × 'Pride of Tremough.'

Lt.-Col. G. H. Loder, Handcross, Sussex: *Rhododendron sperabile* and *R. chaetomallum*.

Lionel de Rothschild, Esq., Exbury, Hants: *Rhododendron eclectum* and *R.* 'Ayesha.'

H. White, Esq., Sunningdale: *Rhododendron* K.W. 5258.

Sir William Milner, Skipton, Yorks.: *R.* sp.

The Marchioness of Londonderry, Newtownards, Co. Down: *Rhododendron seinghkuense*, *R. haematodes* × blood-red *arboreum*, and *R.* × 'Gillian' × blood-red *arboreum*.

DONATIONS TO THE SOCIETY'S GARDENS, 1934 (cont.).

MOORE, H., Dorchester; Plants of double Primulas. MOORE, H. ARMYTAGE, Co. Down; Seed of *Meconopsis superba*. MORTON ARBORETUM, Illinois, U.S.A.; Collection of tree and shrub seeds. MULLIGAN, B. O., Wisley; Seed of *Schizophragma integrifolium*; collections of cuttings and plants. MURPHY, Mrs., Cork; Seedlings of *Callistemon* sp. MUSGRAVE, C. T., Godalming; Collections of seeds and plants. NAPIER, Lt.-Col. G. F. S., Horeham Road; Collections of seeds. NEW YORK BOTANIC GARDEN, U.S.A.; Collection of seeds. NICHOL, J. R., Edinburgh; Shoots of unnamed Apple. NOEL, Lt.-Col. E. W. C., N.W. Frontier, India; Bulbs of *Narcissus Tasetta*. NORDHAGEN, Professor, Bergen, Norway; Seeds of *Papaver lapponicum* and *P. radicum subglobosum*. NORTON, J. L., East London, S. Africa; Collections of seeds. NOTCUTT, R. C., Woodbridge; Collections of plants. ODLING, M., Marton-in-Cleveland; Seed of *Olearia Gunniana*. OLDHAM, W. R., Windlesham; Collection of plants for Award of Garden Merit garden. ORMEROD, E. B., Ascot; Seeds of *Catalpa* sp. OSMASTON, A. E., Wisborough Green; Plants of *Berberis humanaensis* and *B. Osmastonii*. OVERBECK, O., Salcombe; Seed of *Stapelia atropurpurea* and *S. conspurcata*. PAGE, COURTNEY, Haywards Heath; Plants of *Rosa cerasocarpa* and *R. filipes*. PALMER, A. G., Bracknell; Seed of *Phacelia sericea*. PAM, Major A., Wormley Bury; Plant of *Hippeastrum* sp.; seeds of *Alstroemeria campaniflora* and *A. nemorosa*. PARIS NATURAL HISTORY MUSEUM; Collection of seeds. PARK, E. DICKSON, High Wycombe; Plants of *Scolopendrium vulgare*, *Saxifraga Grisebachii montenegrina*, *Androsace argentea*, *Thalictrum kiusianum*; bulbs of *Narcissus Bulbocodium monophyllum*. PENNELL, J., Kingston Hill; Plants from South Africa and *Anchusa sempervirens*; collection of seeds. PERRY, AMOS, Enfield; Collection of herbaceous plants and ferns. PETMAN, Mrs., Hastings; Seeds of *Notholirion Thomsonianum*. PIKE, A. V., Windsor Forest; Seeds of *Myrtus* sp. PLATT, J. W. D., Edinburgh; Seeds of *Kalmia polifolia microphylla* and *Polemonium confertum*. PORTER, G. P., Wimborne; Collections of rock plants. QUIRKE, Major R. F., Chester; Seeds of *Celosia* sp. RAFFILL, C. P., Richmond; Seeds of *Lilium Brownii colchesteri* (wild form) and *Nomocharis nana*. RAMSBOTTOM, J., British Museum; Plants of *Cypripedium* sp., *Magnolia globosa*, *Primula eburnea*. REEVES, A. E., Holbeach; Plants of Strawberry 'Pillnitz.' RIPLEY, Lady, Bucknall; Collection of seeds from New Zealand. ROBERTS, Mrs., Bognor; Seeds of *Bignonia Tweediana*, *Jacaranda* sp., and hybrid *Sparaxis* x *Sireptanthura*. ROBERTS, Mrs. BRADLEY, Farnham; Plants of *Pittosporum* sp. ROGERS, Mrs. C. M., Nairobi, per Mr. F. J. CHITTENDEN, R.H.S.; Corms of *Sparaxis* sp. ROGERS, R. B., Launceston; Seeds of *Berberis nepalensis*, *Osbeckia nepalensis* and *O. stellata*. ROMNEY, Earl of, King's Lynn; Cuttings of *Ceanothus* 'Gloire de Versailles', *Caryopteris Mastacanthus*, *Perovskia atriplicifolia*. ROSENHEIM, P., East Molesey, per A. SIMMONDS, R.H.S.; Seeds of *Lilium Washingtonianum album*. ROTHSCHILD, L. DE, Southampton; Collection of Nymphaeas, and Rock's Rhododendrons; seedlings of *Rhododendron hirsutum*, white var.; plants of 'Romany Chai', *Rhododendron* large species, *Plagi-anthus Lyallii*, *Hoheria populnea*. RYDER, Mrs., Ripley; "Lloyd's Encyclopaedic Dictionary" for the Library. SALOMONSEN, E., Kingston; Plants of *Jasminum* sp. and *Musa* sp. SANDEMAN, F. D. S., Angus; Collection of *Meconopsis* and *Primula* seeds. SANDERSON, The Rev. F., Staunton-by-Dale; Seed of red-berried Elder and *Gentiana lutea*. SAREL, Rear-Admiral C., Robertsbridge; Collection of Acacia seeds. SAYER, Miss G. M., Midhurst; Seedlings of Larkspur-like plant from Czechoslovakia. SCHOMBERG, R. C. F., Ross; Seeds of *Gentiana Moorcroftiana*, seeds from the Karakoram and Peach stones. SCORER, Mrs., Sudbrooke; Seed of *Abutilon vitifolium*, and white variety. SCOTT, Miss C. G., Chelsea; Seeds of climbing plant. SENIOR, R. M., Ohio; Seeds of *Campanula retrorsa*. SHELTON, W. G., Oxted; Collection of plants, *Crocus* species and varieties. SIMMONDS, A., R.H.S.; Corms of *Crocus sativus Cartwrightii*. SIMMONDS, Messrs. H., King's Langley; Plant of *Cotoneaster hybrida pendula*. SIMPSON, Messrs. W. H., Birmingham; Collection of Lupins. SLESSOR, Major P., London; Seed of Golden Wattle. SLINGER, W., Newcastle, Co. Down; Collection of shrubs. SMITH, R. I., Oxenhope; Plants of *Primula Moorcroftiana* and *P. glabra*. SOUILLET, Abbé, France; Seeds of *Lilium venustum*, *L. Catesbaei*, *L. michiganense* and *L. tsingtauense*. SOUTHAMPTON UNIVERSITY COLLEGE; Collection of seeds and plants. SPINGARN, J. E., New

York; Seeds of *Clematis eriophora* and *C. Scottii*. STERN, Major F. C., Goring-by-Sea; Collection of seeds. STOKER, Dr. F., Loughton; Seeds of *Aster Porteri*, *Alnus sitchensis* and *Monotropa uniflora*. STORY, E. M., South Petherton; Seeds of *Mirabilis* sp. STOUT, Dr. A. B., Botanic Garden, New York; Cuttings of hybrid Poplars. SUTTON & SONS, Messrs., Reading; Collection of seeds of annual plants, Tulip species, etc. TAYLOR, G., Edinburgh; Seed of *Aquilegia longissima*. THOMPSON, Mrs. H. P., Weybridge; Collection of rock plants. THOMSON, P. MURRAY, Angus; Seeds of yellow Lupin. TIMARU BOROUGH COUNCIL, New Zealand; Collection of seeds. TIPPING, Mrs. L., Godalming; Collection of seeds; book for the library. TOKYO IMPERIAL UNIVERSITY BOTANIC GARDEN, Japan; Collection of seeds. TOMALIN, T. E., Rowland's Castle; Seed of *Salvia patens* 'Cambridge Blue.' TORONTO UNIVERSITY DEPARTMENT OF BOTANY, Canada; Collection of seeds. TROTTER, R. D., Ockley; Collection of shrub seeds; collection of Crocus seeds; corms of *Crocus chrysanthus*, etc. TYARS, J. H., Ashford; Seeds of Blue Pea; corms of Fritillaries. U.S.A. DEPARTMENT OF AGRICULTURE, WASHINGTON; Plants of Strawberries 'Corvallis,' 'Ettersburg 121,' 'Marshall,' and 'Redheart.' VIENNA BOTANIC GARDEN, Austria; Collection of seeds of rock plants. VILMORIN-ANDRIEUX ET CIE, Messrs., Paris; Collection of shrub and other seeds. WAKEHURST, Lord, Ardingly; Plant of *Cytisus supranubius*. WALDO AGRICULTURAL EXPERIMENTAL STATION, Oregon, U.S.A.; Plants of Strawberry 'Clark.' WARBURG, Sir OSCAR, Epsom; Collection of cuttings and plants. WARD, Capt. F. KINGDON, Harlington, per Col. DURHAM, R.H.S.; Seed of *Manglietia* sp. WATERER, Miss, Long Rock; Plant of *Erica cinerea* 'Eden Valley.' WATKINS & SIMPSON, Messrs., London; Collections of plants and seeds. WATT, J. C., Aberdeen; Seed of Custard Apple and *Rheum nobile*. WATTS, Mrs., Charlbury; Seedlings of *Paeonia Cambessedesii*. WEBB, Miss, Knock, Belfast; Collection of alpine plant seeds from Switzerland. WEEKS, A. G., Limsfield; Plants of *Lilium centifolium* and *Gentiana sino-ornata*. WEISS, Professor, Merrow; Collection of seeds. WELLS, B., Merstham; Collections of herbaceous plants, alpine plants, and seeds. WHITELEGG, G. G., Chislehurst; Plants of Azaleas. WHITTON, Lt.-Col., West Byfleet; Seeds from India 50 years old. WILCOCKSON, E., Pernambuco; Seed of tree like a Carmichaelia. WILLIAMSON, Mrs. K. H., Aberdeen; Plant of *Saxifraga granulata* hybrid. WILLMOTT, Miss, Great Warley; Collection of seeds. WILSON, F. R. L., Godalming; Plant of *Poinciana Gilliesii*. YONGE, Mrs. D. M., Yealmpton; Seed of *Dierama pulcherrimum*. ZIMMERMAN, E. P., Carlsbad, California; Seed of *Statice Zimmermannii*; collection of plants of *Watsonia* hybrids.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

AMATEURS' FLOWER SHOW.

The month of June is one in which the amateur gardener has many opportunities of bringing up his best and favourite flowers. The calendar includes shows staged by the Iris Society, the Viola and Pansy Society, and the British Delphinium Society: and this Society's Annual Amateurs' Flower Show.

Perhaps the Society's Tenth Amateurs' Show on Tuesday, June 25, is the most important of these. All entries should be sent in not later than the first post on Tuesday, June 18, although the Secretary has discretionary power to accept late entries up to noon on Monday, June 24. A schedule of the classes may be obtained on application from the Secretary.

All Floral Committees will meet on the occasion of this Show, which gives the amateur who does not often visit London an opportunity of bringing to the notice of the Committees any new or particularly well-cultivated plant that he may possess.

A special exhibit from the garden at Wisley of "Pests and Diseases" will be staged, and representatives of the Scientific Staff will be at hand to assist in solving any problems of cultivation and disease which may be submitted to them.

CONFERENCES.

Conference on Cherries and Soft Fruits.

As has already been announced, the Cherry and Soft Fruit Conference will be held on July 16 and 17, 1935, in the Lecture Room of the New Hall, Greycoat Street, S.W. 1.

Programme of Conference.

TUESDAY, JULY 16, AFTERNOON, 3-5.

Lord ABERCONWAY, C.B.E., V.M.H., President of the Royal Horticultural Society, in the Chair, supported by Mr. E. A. BUNYARD, F.L.S., V.M.H., Chairman of the Soft Fruit Conference Committee.

- (i) "Cherries for Market Growing Purposes," by Mr. L. DOUBLEDAY, followed by Mr. E. A. BUNYARD and Mr. BRIDGES DIXON.
- (ii) "Growing Healthy Strawberries," by Mr. RONALD VINSON, followed by Dr. SWARBRICK, Mr. A. M. MASSEE, Mr. C. H. OLDHAM and Mr. T. R. C. BLOFELD.

WEDNESDAY, JULY 17, MORNING SESSION, 11-1.

Mr. H. V. TAYLOR, O.B.E., B.Sc., A.R.C.S., Commissioner of Horticulture Ministry of Agriculture and Fisheries, in the Chair.

- (i) "Nutrition and Manuring of Soft Fruits," by Dr. T. WALLACE, followed by Mr. H. GOUDE and Mr. C. D. CARTER.
- (ii) "Growing Healthy Raspberries," by Mr. R. V. HARRIS, followed by Mr. J. MCINTYRE and Mr. G. C. JOHNSON.

WEDNESDAY, JULY 17, AFTERNOON SESSION, 3-5.

Sir WILLIAM G. LOBJOIT, O.B.E., J.P., V.M.H., Chairman of the Fruit and Vegetable Committee of the National Farmers' Union, in the Chair.

- (i) "Soft Fruits for the Private Garden," by Mr. A. N. RAWES, followed by Mr. R. H. HALL and Mr. T. E. TOMALIN.
- (ii) "Blackberries and like Berries for Garden Purposes," by Mr. M. B. CRANE, followed by Miss A. B. BEAKBANE.
- (iii) "The Bottling of Soft Fruits," by Miss E. M. GUNNELL.

The following additional papers will be published in the Report :

- "Varieties of Cherries," by Mr. E. A. BUNYARD.
- "Soft Fruits ; Varieties under Trial at Wisley," by Mr. A. N. RAWES.
- "Varieties of Fruits for Canning," by Mr. W. B. ADAM.
- "Gooseberries for Market," by Mr. H. C. SELBY.

A limited number of copies of the papers to be discussed at the Conference will be available in advance for those who are particularly interested and intend being present at the Conference. Applications for these advance copies should be sent in at once.

On the occasion of this Conference there will be special competitive classes for Cherries and Soft Fruits for amateurs, the schedules of which are obtainable from the Secretary. It is hoped that many amateur growers will send in fruit for competition.

In the Old Hall the Kent Branch of the National Farmers' Union will stage their Annual Show of Cherries and Soft Fruits, at which the Challenge Cup, presented by the Society to the Kent Branch, will be competed for.

Conference on Alpine Plants, 1936.

The preliminary programme of the Conference on Alpine Plants, to be held in May next year, was published in the May number of the JOURNAL. All Fellows interested in this Conference are asked to communicate with the Secretary.

International Conferences.

During the autumn of this year two International Conferences are to take place. The first, the International Botanical Congress at Amsterdam, on September 2-7 ; the second, the International Horticultural Congress at Rome, on September 16-21. One of the important subjects to be discussed is that of plant nomenclature, and the Council has set up a special committee to prepare lists with the object of stabilizing the nomenclature of horticultural plants. The general rules for naming of plants were published in the January number of this JOURNAL, vol. 60, p. 39.

CALENDAR.

June 4, 1-7.30 P.M., and June 5, 10 A.M. to 5 P.M.—Fortnightly Meeting. Although this show immediately follows the Chelsea Show, there are likely to be very good displays of herbaceous plants.

In the Lecture Room of the New Hall at 3.30 P.M. on June 4 Mr. R. C. and Mr. R. F. NORCURT will speak on "The Best Japanese Cherries for an English Garden," illustrating their lecture with lantern slides.

On the second day, June 5, in the Lecture Room at 3.30 P.M. Mr. CHEAL will lecture to members of the Institute of Landscape Architects on "Pruning and Care of Trees and Shrubs." Fellows of our Society are admitted to this lecture.

June 6, 1-7.30 P.M., and June 7, 10 A.M. to 5 P.M.—The Iris Society will hold its Show. There will be a special exhibit from the R.H.S. Gardens at Wisley in illustration of Iris Diseases.

June 14.—The Teachers' Advanced Practical Examination will be held at Wisley, and on June 17-21 the Preliminary Practical Examination for the National Diploma in Horticulture will likewise be held at the Gardens.

June 18, 1-7.30 P.M., and June 19, 10 A.M. to 5 P.M.—Fortnightly Meeting. Delphiniums and Roses are likely to hold the day. At this meeting there will be a competition for the Sewell Medal for Alpines, the regulations for which will be found in the January number of the JOURNAL, p. 30, paragraph 13.

The London and South of England Viola and Pansy Society will stage their exhibits at this meeting.

In the afternoon of June 18, at 3.30, in the Lecture Room of the New Hall, Mr. C. T. MUSGRAVE will speak on "Gentians," and at 4.30 in the Restaurant of the Old Hall the Lily Group will meet to discuss "Californian Lilies."

June 21, 1-7.30 P.M., in the Old Hall, there will be a Show staged by the Civil Service Horticultural Federation, being the Federation of the many Horticultural Societies of the Civil Service. This is the first show of its kind, and it should prove of interest. Fellows' tickets will admit.

June 25, 1-7.30 P.M.—The Society's Tenth Amateur Flower Show. Intending exhibitors are reminded that June 18 is the closing date for entries. (See preliminary paragraph of these notices.)

June 25-28.—The National Diploma in Horticulture Final Practical Examination will be held at Wisley.

June 27, 1-7.30 P.M.—British Delphinium Society's Show. The Joint Delphinium Committee meets at 12.15 P.M. to examine new Delphiniums.

July 2, 1-7.30 P.M., and July 3, 10 A.M. to 5 P.M.—Fortnightly Meeting. Lilies will be a special feature of this Show, and a competition for the best hybrid Lily will commence at this Show, and will be continued at the Show on July 16 (*q.v.*). In addition to Lilies, there are likely to be displays of summer flowers and Gladioli, which will be beginning to make their appearance.

At 3.30 in the Lecture Room of the New Hall, on July 2, the Lily Group will meet and discuss "The Lilies exhibited." Fellows are reminded that, although they may not be enrolled on the Lily Group, they are nevertheless invited to take part in these discussions.

The Secretary of the Lily Group would be pleased to hear from members of the Lily Group of their intention to be present at the Lily Group Dinner, which is to be held in the Restaurant of the New Hall at 7 P.M. on July 2.

In the Old Hall on that day, July 2, from 1 to 7.30 P.M., and on July 3, from 10 A.M. to 5 P.M., the Cactus and Succulent Society will hold their Show.

July 5.—According to the Calendar published in the January JOURNAL, the National Sweet Pea Society should have held their Show in the New Hall on this day, but this has been cancelled, and arrangements have been made for the Show to take place at Hastings on July 3 and 4, in the Alexandra Park. Anyone interested in this Show should write to Mr. A. C. BARTLETT, Secretary of the National Sweet Pea Society, 19 Bedford Chambers, London, W.C. 2, for particulars.

July 12.—Trial of all types of apparatus for Liquid Spraying, but not including spray guns, which will take place at Wisley. (See special paragraph, p. lxxxiv.)

July 13.—Lily Group Garden Meeting. Arrangements are being made for a visit to Mr. C. R. SCRASE-DICKINS's garden at Coolhurst, Horsham, and Lieut.-Colonel L. C. R. MESSEL's garden at Nymans, Handcross. Further particulars may be obtained from the Secretary.

July 16, 1-7.30 P.M., and July 17, 10 A.M. to 5 P.M.—Fortnightly Meeting. Competition for Cherries and Soft Fruits in the New Hall, and in the Old Hall the Annual Show of Cherries and Soft Fruits staged by the Kent Branch of the National Farmers' Union.

Intending competitors for the Soft Fruit Show are reminded that the entries close on July 9.

The Competition for the best hybrid Lily will be continued at this week's show. (See July 2.)

This is the occasion of the Conference on Cherries and Soft Fruits, for particulars of which see special paragraph, p. lxxxii.

July 23, 1-7.30 P.M., and July 24, 10 A.M. to 5 P.M.—National Carnation and Picotee Society's Show. The Joint Border Carnation and Picotee Committee will meet at 3 P.M. on this occasion to judge new border Carnations.

July 24 and 25.—Demonstrations will be given, weather permitting, from 2 to 4 P.M. in the Wisley Gardens, on "Summer Pruning of Fruit Trees and Shrubs." Fellows intending to be present at these demonstrations are requested to notify the Director of the Gardens, Wisley, Ripley, Surrey, so that adequate arrangements may be made.

July 30, 1-7.30 P.M., and July 31, 10 A.M. to 5 P.M.—Fortnightly Meeting. At this Show the Clay Cup for Scented Roses will be awarded. This Challenge Cup is offered for a Rose of good form and colour, not in commerce before the current year, possessing the true old Rose scent, such as may be found in the old Cabbage or Provence Rose in 'General Jacqueminot,' 'Marie Baumann,' 'Duke of Wellington,' 'General McArthur,' etc. The scent known as "Tea Rose" is not, for the purposes of this competition, to be counted the true old Rose scent. Not more than three different varieties may be shown by one competitor, and at least three and not more than six blooms or trusses of each variety will be

required, together with a plant in flower and bud. The cup will be awarded only once for the same Rose, and is open for competition to trade and amateur growers. Entries must be received not later than the first post on Wednesday, July 24, on special forms obtainable from the Secretary.

On July 30 an additional lecture will be held (as announced in the May JOURNAL) in the Lecture Room of the New Hall at 3.30 P.M., when Mr. F. R. LONG, Associate of Honour of this Society, and President of the Association of Superintendents of Parks and Gardens, South Africa, will address the Fellows of the Society on the South African Flora. The lecture will be illustrated with lantern slides. Will Fellows kindly make a note of this lecture in their diaries?

SILVER JUBILEE MEDAL FOR AFFILIATED SOCIETIES.

In commemoration of Their Majesties' Silver Jubilee, the Council has decided to offer to Affiliated Societies a specially designed Silver Medal in place of the Banksian Medal, which is usually presented by Affiliated Societies as the premier award at their shows. The conditions under which this Medal will be presented may be obtained on application to the Secretary, when a copy of last year's schedule of the Affiliated Society should be forwarded.

WISLEY GARDENS.

The Garden.

In June the Garden attains its most flowery state, the rock garden and Seven Acres being in particular notable for their colour and variety of interest. In the latter collection of shrubs *Philadelphus*, *Deutzia*, *Spiraea*, *Pyracantha*, *Viburnum* will be at their best, and although most of the Lilacs will be over, a walk along the river bank will show many Rose species and other shrubs in flower at the northern end of the Gardens.

In the wild garden *Primula japonica* is succeeded by *P. florindae*, and several sorts of *Meconopsis* and *Lilium* (including *L. giganteum*) come into bloom. Here also will be seen the later Azaleas and Rhododendrons, with *Magnolia Wilsonii*, *Cornus florida* and *Kalmia latifolia*.

In the trial grounds on the hillside above the main Rose Walk, Lupins, Delphiniums, Paeonies, Oenotheras, and Heucheras will flower this month, providing a comparison of the best varieties of each growing side by side. From the end of the Rose walk a path leads into the new Iris Garden, where the tall bearded kinds are collected together. Other moisture-loving Irises will be in full bloom along the banks of the ponds, and various species beside the path which runs from the vinery to Seven Acres.

The Rose border leading up the hill towards the alpine house begins to look attractive, while the alpine house contains many Saxifrages of the *longifolia*, *lingulata* and *cotyledon* types. Other members of the encrusted section of this family will be found on the rock garden, and such plants as Phlox, Dianthus, Campanulas and Pentstemons are likely to be in flower.

Trial of Spraying Machines for Liquids for Gardens, Orchards and Fields.

A Trial of all types of apparatus for liquid spraying (but not including spray guns) is being arranged and will take place on Friday, July 12, 1935.

The Trial will cover apparatus suitable for the following classes of work:

- (a) Hand-work in small gardens—i.e. syringes of all types, continuous-pumping and pneumatic sprayers and diffusers, bucket and similar light sprayers.
- (b) Large gardens, market gardens, bush-fruit plantations and large glass-houses—i.e. continuous-pumping and pneumatic knapsack sprayers, barrel and tank sprayers and headland sprayers.
- (c) Fruit farms and large market gardens—i.e. power sprayers for wet spraying.

In judging the machines their suitability for use with the following will be taken into account:

- (a) Nicotine and similar washes, including soap and oil emulsions.
- (b) Bordeaux mixture.
- (c) Arsenical washes in suspension—lead arsenate.
- (d) Caustic winter washes.
- (e) Tar-oil washes.
- (f) Lime-sulphur washes.
- (g) Acid washes.

Other considerations will be :

General Construction.

- (a) Simplicity and accessibility of parts, particularly pump and valves.
- (b) Ease of working.
- (c) Ease of repair and replacement of valves, washers, pump packing, etc.
- (d) Agitating devices.
- (e) Durability.
- (f) Power.
- (g) Portability or ease of traction.

Nozzles.

- (a) Fineness of spray, penetration and covering power.
- (b) Simplicity of construction.
- (c) Ease of clearing choked nozzles.

Cost of apparatus, accessories and spare parts.

Fellows desiring to be present at the Trials and to see the working of the apparatus, please notify the Secretary beforehand.

White Fly Parasite.

The parasite of the greenhouse white fly, *Encarsia formosa*, has proved extremely effective in checking the increase of this pest under glass where it has been introduced, and large numbers have been distributed during the past few years. The demand has become so great that in order to meet in a measure the cost of maintaining the parasite over the difficult winter months and packing and despatching it, the Council have fixed a charge of 2s. 6d. for a supply for a small house and 5s. for a large house, and applications for it should be accompanied by the sum named. It is useless to introduce it to houses until the average temperature is about 70° F. Early application should be made since the supply is limited, and it is hoped that Fellows who have found it successful will distribute it in their neighbourhood.

GENERAL MEETINGS.

APRIL 9, 1935.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE (British Carnation Society's Show).—Mr. J. M. BRIDGEFORD in the Chair, and ten other members present.

Exhibit.

Messrs. Allwood Bros., Haywards Heath : Carnation 'Scarlet Pelargonium.'

APRIL 16-17, 1935.

DAFFODIL SHOW.

Chief Awards in the Competitive Classes.

The Engleheart Challenge Cup, and a *Silver-gilt Flora Medal*, for twelve varieties of Daffodils raised by the exhibitor.

To Mr. J. L. Richardson, Prospect House, Waterford.

Silver-gilt Banksian Medal, for twelve varieties of Daffodils not in commerce.

To Mr. Guy L. Wilson, The Knockan, Broughshane, co. Antrim.

The Banksian Medal offered for the best bloom shown in the competitive classes was awarded to Mr. R. F. Calvert, Coverack, for a bloom of *Narcissus* 'Pera.'

DAFFODIL CONFERENCE.

A Conference on Daffodils took place on April 16-18, a full report of which will appear in the Daffodil Year Book, 1935.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair and six other members present.

Hippeastrum var.—Mr. Cotton reported that the *Hippeastrum* shown at the last meeting appeared to be a hybrid of *H. vittatum* which Baker had called *H. × Carnarvonina*.

Schizocodon macrophyllus.—He also reported that the branching of the inflorescence of the *Schizocodon* shown at the last meeting was apparently normal and that the plant agreed with the knowledge available concerning *S. macrophyllus*.

Lily scales.—Dr. Tincker reported that in a comparison of the rate of bulb production on detached scales of *Lilium candidum* the rate was much higher when the scales were half buried. The green leaves were visible from buried scales on Jan. 29, 1935, in 1 out of 100 and in half-buried scales 11, and at monthly intervals 5 and 35, 15 and 44, 27 and 73 respectively. One hundred scales had been placed in each position on October 19, 1934.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and eighteen other members present.

The business before the Committee consisted of specimens of Apples for identification.

FLORAL COMMITTEE A.—Mr. J. M. BRIDGEFORD in the Chair, and sixteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Chaplin, Waltham Cross, for Roses.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Blackmore & Langdon, Bath, for Polyanthus.

To Messrs. B. R. Cant, Colchester, for Roses.

Silver Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Schizanthus.

To Mrs. Bucknall, Doneraile, for Anemones.

To Mr. J. Douglas, Great Bookham, for Auriculas.

To Messrs. Engelmann, Saffron Walden, for Carnations and Euphorbias.

To Mr. E. J. Hicks, Hurst, for Roses.

To Messrs. Sutton, Reading, for coloured Primroses and flowering shrubs.
To Mr. G. Wood, Ashted, for hardy plants.

Banksian Medal.

To Miss C. Christy, Chelmsford, for Polyanthus, Primroses, etc.

To Sir Daniel Hall, F.R.S. (gr. Mr. W. Gill), Merton Park, for *Cineraria stellata* 'Gill's Blue.'

Selected for trial at Wisley.

Primula 'Nancy Lansdell,' from Mr. F. J. Lansdell, Brighton.

The following award was recommended after trial at Wisley.

Highly Commended.

To Schizanthus 'Bath Giant Blotch Strain,' from Messrs. Blackmore & Langdon, Bath. See p. 276.

Other Exhibits.

Messrs. Clark, Dover : Primroses and Anemones.

Messrs. John & A. H. Crook, Beaconsfield : Polyanthus.

Mrs. Fremantle, Penn : Polyanthus.

Mr. F. J. Lansdell, Brighton : Primula 'Ruth Kermode.'

Mr. R. V. Roger, Pickering : Primula 'Firby Glory.'

Messrs. Russell, Richmond : Clivias.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Waterer, Sons & Crisp, Bagshot, for flowering shrubs

Silver Banksian Medal.

To Hocker Edge Gardens, Cranbrook, for bulbous plants.

To Mr. E. Ladhams, Elstead, for shrubs and hardy plants.

Flora Medal.

To Messrs. Low, Enfield, for greenhouse shrubs.

To Messrs. Prichard, Christchurch, for alpine plants.

To Messrs. Waterer, Sons & Crisp, Bagshot, for alpine plants.

To Mr. G. E. Welch, Cambridge, for alpine plants.

Banksian Medal.

To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for flowering shrubs.

To Colesbourne Gardens, Cheltenham, for Fritillarias and other bulbous plants.

To Mr. W. A. Constable, Southborough, for *Lilium tenuifolium*.

To Messrs. C. Elliott, Stevenage, for alpine plants.

To Messrs. Reuthe, Keston, for flowering shrubs.

To Messrs. Russell, Richmond, for flowering shrubs.

Award of Merit.

To *Erythronium californicum* as a hardy flowering plant (votes unanimous), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. See p. 272.

To *Malus Halliana* as a hardy flowering tree (votes unanimous), from Mr. W. Bates, Wokingham. See p. 272.

To *Primula Rockii* as a hardy flowering plant for the rock garden and alpine house (votes 14 for), from the Director, R.H.S. Gardens, Wisley. See p. 274.

To *Prunus subhirtella flore pleno* as a hardy flowering tree (votes unanimous), from Collingwood Ingram, Esq., Benenden. See p. 274.

To *Schizocodon soldanelloides ilicifolius albus* as a flowering plant for the rock garden and alpine house (votes 10 for), from Dr. Fred Stoker, Loughton. See p. 276.

To *Trifolium uniflorum*, Millard's variety, as a flowering plant for the rock garden and alpine house (votes unanimous), from F. W. Millard, Esq., Felbridge. See p. 276.

Other Exhibits.

Alpine Nursery, West Moors : alpine plants.

Dr. M. Amsler, Eton : Primula 'Alice Rushton.'

Messrs. Barr, Taplow : bulbous plants.

Mr. Wm. Bates, Wokingham : *Prunus serrulata* var. *formosissima*, *P. serrulata* var. *amabilis*.

Mr. H. S. Boothman, Maidenhead : alpine plants.

Miss C. Beck, Great Amwell : *Fritillaria latifolia*.

Mrs. Bucknall, Doveraile : *Reseda alba*.

Messrs. Casburn, Bedford & Page, Cambridge : alpine plants.

Dorset Nurseries, Blandford : alpine plants.
 C. Elliott, Esq., Stevenage : *Primula pubescens* 'Phyllis Elliott.'
 Lt.-Col. C. H. Grey, Cranbrook : *Lewisia brachycalyx*, *Erythronium japonicum*.
 T. Hay, Esq., Hyde Park : *Viola papilionacea*.
 Miss Hopkins, Coulsdon : hardy plants.
 C. Ingram, Esq., Benenden : *Prunus mutabilis*.
 Mr. A. Kench, Weybridge : alpine plants.
 Knap Hill Nursery Co., Woking : *Erica australis*.
 Iris Lady Lawrence, Dorking : *Ribes Gordonianum*, *Ercilla volubilis*.
 Messrs. Maxwell & Beale, Broadstone : alpine plants.
 Mrs. R. L. Newman, Dartmouth : *Pelargonium echinatum*.
 Messrs. Prichard, Christchurch : *Polygala calcarea*, Bulley's variety, varieties of *Primula marginata*.
 Messrs. Redgrove & Patrick, Sevenoaks : hardy plants.
 W. Robinson, Esq., East Grinstead : *Clematis sibirica*, Gravetye form.
 Messrs. Russell, Richmond : *Dracæna* 'Sunset', *Begonia* sp., *Clematis alpina* form.
 Hon. Mrs. Sebag Montefiore, Plymouth : *Acacia juniperina*, *A. verticillata*.
 Dr. Fred Stoker, Loughton : *Primula* 'W. C. Ward.'
 J. Cromar Watt, Esq., Aberdeen : *Camellia japonica alba grandiflora*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. McBean, Cooksbridge, for a group.

Banksian Medal.

To Messrs. H. Dixon, Wandsworth, for a group.

Award of Merit.

To *Odontioda* × 'Thora' (*Odontioda* × 'Ben Hur' × *Odontoglossum* × 'Omega') (votes 10 for), from Messrs. McBean, Cooksbridge. See p. 274.

To *Cymbidium* × *Pauwelsii*, Brockhurst var. (*insigne* × *Lowianum*) (votes 7 for), from F. J. Hanbury, Esq., East Grinstead. See p. 272.

Other Exhibits.

Lionel de Rothschild, Esq., Exbury : *Miltonia* × 'Limelight,' Exbury var.

N. Prinsep, Esq., Pevensy : *Miltonia* × 'Limelight' var. 'Gladys Joel.'

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twenty other members present.

The Peter Barr Memorial Cup.

It was recommended that the Peter Barr Memorial Cup, which is awarded annually to someone who has done good work on behalf of the Daffodil, be awarded to Mr. F. A. Secrett, Holly Lodge Farm, Walton-on-Thames.

Awards Recommended :—

The following awards were recommended for exhibits of Daffodils :—

Gold Medal.

To Mr. J. L. Richardson, Prospect House, Waterford.

Silver-gilt Flora Medal.

To Messrs. F. Rynveld, Hillegom, Holland.

To Messrs. Barr, Covent Garden.

To Mr. Guy L. Wilson, Broughshane, co. Antrim.

To Mr. F. A. Secrett, Holly Lodge Farm, Walton-on-Thames.

Silver-gilt Banksian Medal.

To Messrs. J. T. White, Spalding.

To Messrs. R. H. Bath, Wisbech.

To The Donard Nursery Company, Newcastle, co. Down.

To Mr. R. F. Calvert, Coverack, Cornwall.

Silver Flora Medal.

To Mr. W. A. Watts, St. Asaph.

To Mr. Peter Lower, Harpenden.

To Messrs. Dobbie, Edinburgh.

Silver Banksian Medal.

To Messrs. D. Stewart, Ferndown, Wimborne.

To Messrs. Wakeley, Bankside, S.E.

To Messrs. J. R. Pearson, Lowdham.

To Mr. A. K. Watson, Upton, Acle, Norfolk.

Banksian Medal.

To Mr. H. G. Longford, Abingdon.

To The Bronwylfa Fruit and Bulb Farm, St. Asaph.

To Messrs. Daniels, Norwich.

First-class Certificate.

Narcissus 'Dinkie' as a show flower (votes 12 for, 3 against), from Mr. R. F. Calvert, Coverack, Cornwall. See p. 272.

Narcissus 'Pera' as a show flower (votes 14 for, 4 against), from Mr. R. F. Calvert. See p. 273.

Award of Merit.

Narcissus 'Crocus' as a show flower (votes unanimous), from Mr. J. L. Richardson, Waterford. See p. 272.

Narcissus 'Effective' as a show flower (votes 13 for), from Mr. G. L. Wilson, Broughshane. See p. 272.

Narcissus 'Golden Wedding,' as a show flower (votes 13 for, 3 against), from Mr. G. L. Wilson. See p. 273.

Narcissus 'Principal' as a show flower (votes 17 for), from Mr. G. L. Wilson. See p. 273.

Narcissus 'Slemish' as a show flower (votes unanimous), from Mr. G. L. Wilson. See p. 274.

Narcissus 'Queen of the North,' for garden decoration, after trial at Kirton, from Messrs. Bath, Wisbech. See p. 274.

Narcissus 'Glorious,' for garden decoration, after trial at Kirton, from Mr. J. L. Richardson. See p. 273.

Narcissus 'Ian Secrett,' for cutting from the open, after trial at Gulval, from Mr. F. A. Secrett, Walton-on-Thames. See p. 273.

Tulipa lanata (votes unanimous), from Messrs. van Tubergen, Haarlem, Holland. See p. 276.

Highly Commended.

Narcissus 'Outrider,' after trial at Kirton, from Mr. F. A. Secrett. See p. 273.

Narcissus 'Grand Master,' after trial at Kirton, from Messrs. Tyler, Southrepps, Norwich. See p. 273.

Cultural Commendation.

To the Director, R.H.S. Gardens, Wisley, for a fine pan of *Narcissus triandrus pulchellus* (New Zealand form).

Plants selected for Trial.

The following, shown by Mr. W. A. Watts, were selected for trial at Wisley as varieties for garden decoration:—

Narcissus 'Cresta.'

Narcissus 'Santa Cruz.'

JOINT IRIS COMMITTEE.—Mr. C. W. CHRISTIE MILLER in the Chair, and six other members present.

Award Recommended:—**Award of Merit.**

To *Iris Grant-Duffii* var. *melanosticta* (votes unanimous), for general garden use, from Messrs. Barr and Sons, Taplow, Bucks. See p. 272.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and eleven other members present.

Awards Recommended:—**Award of Merit.**

To *Rhododendron* 'Cornish Cross,' Exbury var. (votes 9 for), from Lionel de Rothschild, Esq., Exbury, Hants. See p. 275.

Preliminary Commendation.

To *Rhododendron* 'Brenda' (votes unanimous), from Lt.-Col. Giles Loder, High Beeches, Handcross, Sussex.

Other Exhibits.

Mr. G. Reuthe, Bromley, Kent: *Rhododendron* 'Mrs. G. Reuthe' (*R. Edgeworthii* × *R. fragrantissimum*).

Lionel de Rothschild, Esq.: *R. hyperythrum*.

Mr. I. Whitaker, Pylewell Gardens, Lymington: *R. sp. sub* KW. 6805.

APRIL 24-25, 1935.

EARLY MARKET PRODUCE SHOW.

The Chief Awards in the Competitive Classes were :—

Silver Cup for the most successful competitor.

To Mr. H. Poupart, Walton-on-Thames.

Silver Knightian Medal, for the competitor gaining the highest number of prize-points for salad vegetables.

To Messrs. H. & A. Pullen Burry, Ltd., Sompting.

Silver Knightian Medal, for the competitor gaining the highest number of prize-points for forced vegetables.

To Mr. H. Poupart, Walton-on-Thames.

Silver Knightian Medal, for the competitor gaining the highest number of prize-points for outdoor-grown vegetables.

To Mr. A. W. Secrett, Ham, Surrey.

Silver Banksian Medal, for the competitor gaining the highest number of prize-points for flowers.

To Messrs. J. T. White, Spalding.

Non-competitive exhibits.

The central feature of the show was a co-operative display of vegetables and fruit for which the Schedule Committee was responsible.

Gold Medal.

To Mr. F. A. Secrett, Walton-on-Thames, for an exhibit of vegetables and flowers in market packages.

To Messrs. Sutton, Reading, for an exhibit of vegetables.

Silver-gilt Knightian Medal.

To Mr. A. W. Secrett, Ham, Surrey, for an exhibit of early vegetables in market packages.

Silver-gilt Banksian Medal.

To the Glasshouse Growers and Market Gardeners of Kent, for an exhibit of flowers and vegetables in market packages.

To Mr. J. Harnett, Hoddesdon, for an exhibit of Hydrangeas and *polyantha* Roses.

Silver Knightian Medal.

To the South Lincolnshire Growers, for an exhibit of vegetables and flowers in market packages.

To Messrs. the Sussex Nurseries, Rustington, for an exhibit of Mushrooms and other early vegetables.

Silver Flora Medal.

To Mr. Douglas Foxwell, Balcombe, for an exhibit of Sweet Peas in market packages.

Knightian Medal.

To the Cheltenham Growers' Club, for an exhibit of vegetables in market packages.

To Messrs. Toogood, Southampton, for an exhibit of vegetables.

To Capt. R. G. M. Wilson, Cambridge, for an exhibit of vegetables in market packages.

A lecture was given by Mr. F. A. Secrett, F.L.S., on "Irrigation of Horticultural Crops."

Chairman, Mr. George Monro, C.B.E., V.M.H.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and four other members present.

Polygonatum Kingianum.—Mr. Baker sent from the Oxford Botanic Garden, where it grows under glass, the uncommon *Polygonatum Kingianum*, a native of N. India, with verticillate leaves and purple flowers.

Soil moisture estimation.—Mr. George Fraser, of Ucluelet, British Columbia, sent an interesting note on the use of a wooden stake for estimating the moisture condition of the soil in undrained tin containers used for the cultivation of plants under cover. He found that a softwood stake put to the bottom of the receptacle and withdrawn for examination at need gave an accurate idea of the condition of the soil as regards moisture, a very useful measure where earthen flower pots are difficult to obtain.

Viola from Japan (?)—A *Viola* was received from Mr. C. Ingram, possibly originally from Japan, and was referred to Kew for identification.

Gladiolus biflorus.—Prof. T. T. Barnard sent a plant of *Gladiolus biflorus*. The single flower which it bore had developed an extra segment which made the plant even more unlike a *Gladiolus* than usual. Baker describes the plant as being upon the very edge of the genus in the direction of *Geissorhiza*. The species is a rare one, which occurs in only two or three localities on the Cape Flats. The flowers have the un-*Gladiolus* habit of closing in the evening. It is a question as to whether its generic affinities are with *Gladiolus* or not.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and thirteen other members present.

Awards Recommended :—

See above, p. xc.

Other Exhibits.

Mr. T. Avery, Hemel Hempstead : Strawberry 'Gaddesden.'

Mr. G. Elsom, Spalding : vegetables.

Marchioness of Londonderry, Newtownards : Cherry 'Chinese Early.'

FLORAL COMMITTEE A.—Mr. J. M. BRIDGEFORD in the Chair, and eleven other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To the Glasshouse Growers and Market Gardeners of Kent, for flowers and vegetables packed for market.

To Mr. J. Harnett, Hoddesdon, for Hydrangeas.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Mr. J. Douglas, Great Bookham, for Auriculas.

To Mr. D. F. Foxwell, Balcombe, for Sweet Peas packed for market.

Silver Banksian Medal.

To Mrs. Bucknall, Doneraile, for Anemones.

To Mr. G. H. Dalrymple, Bartley, for Auriculas and Primulas.

To Messrs. Dobbie, Edinburgh, for Schizanthus.

To Messrs. Engelmann, Saffron Walden, for Carnations, Pansies and Euphorbias.

Banksian Medal.

To Dean Gardens, Longniddry, for Primroses and Polyanthus.

To Messrs. Ryder, St. Albans, for Cinerarias.

Other Exhibits.

Messrs. Clark, Dover : Primroses, Irises, etc.

A. Corderoy, Esq., Eltham : Primulas and Aubrietia 'Jubilee.'

Messrs. John & A. H. Crook, Beaconsfield : Polyanthus.

C. J. Howlett, Esq., Earley : Polyanthus.

The Marchioness of Londonderry, Newtownards : Freesias grown in the open.

Mr. H. G. Longford, Abingdon : Polyanthus.

Lionel de Rothschild, Esq., Exbury : Hippeastrums.

Messrs. T. Smith, Newry : Primrose 'Our Pat.'

FLORAL COMMITTEE B.—Lord ABERCONWAY, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Hocker Edge Gardens, Cranbrook, for bulbous plants.

Lindley Medal.

To Lt.-Col. L. C. R. Messel, O.B.E., Handcross, for a collection of hardy terrestrial Orchids.

Flora Medal.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Mr. E. Ladhams, Elstead, for shrubs and hardy plants.

To Messrs. Neale, Newhaven, for Gazanias, Mesembryanthemums and Cacti.

Banksian Medal.

To Mr. J. C. Allgrove, Slough, for flowering Cherries and Crabs.

To Messrs. Casburn, Bedford & Page, Trumpington, for alpine plants.

To Chez Nous Nurseries, Newick, for alpine plants.

To Messrs. Maxwell & Beale, Broadstone, for alpine plants.
 To Messrs. Prichard, Christchurch, for alpine plants.
 To Messrs. Rogers, Southampton, for alpine plants.
 To Messrs. Waterer, Bagshot, for alpine plants.

Award of Merit.

To *Ceanothus prostratus* as a flowering shrub for the rock garden and alpine house (votes 9 for, 3 against), from W. Bentley, Esq., Burghclere, Hants.

To *Ceanothus thyrsiflorus* as a hardy flowering shrub (votes 7 for, 3 against), from T. Hay, Esq., Hyde Park, London, W. 2.

To *Prunus serrulata* 'Horinji' as a hardy flowering tree (votes unanimous), from Collingwood Ingram, Esq., Benenden.

Preliminary Commendation.

To Echium 'Bawdsey Seedling' as a half-hardy flowering plant (votes unanimous), from the Hon. Lady Quilter, Woodbridge.

Other Exhibits.

Lord Aberconway, Bodnant: *Muscari* sp. E.K.B. 243, *Iris Wattii* Ward's form, K.W. 9357.

T. T. Barnard, Esq., Wareham: *Homoglossum Merianellum*, *Gladiolus biflorus*, *G. grandis*.

T. Hay, Esq., Hyde Park: *Cypripedium tibeticum*.

Miss Hopkins, Coulsdon: rock plants.

The Marchioness of Londonderry, Newtownards: *Boronia megastigma*.

Messrs. Prichard, Christchurch: *Primula marginata grandiflora*.

Messrs. Russell, Richmond: *Bougainvillea glabra* 'Lady Hudson.'

ORCHID COMMITTEE.—Dr. F. CRAVEN MOORE in the Chair, and eight other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for a group.

Banksian Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.

Award of Merit.

To *Brassolaeliocattleya* × 'Empire' (C. × 'Heatherwood' × B.-l.-c. × 'Caligula') (votes 6 for), from N. Prinsep, Esq., Pevensey Bay, Sussex. See p. 272.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Barr, Covent Garden, for an exhibit of Daffodils and Tulips.

Silver Banksian Medal.

To Mr. A. K. Watson, Upton, Acle, Norfolk, for an exhibit of Daffodils.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron* × *Thomwilliams*, Bodnant form (votes unanimous), from Lord Aberconway, Bodnant, N. Wales. See p. 276.

To R. 'Alcesta' (votes unanimous), from Lord Aberconway. See p. 275.

To R. 'Portia' (votes unanimous), from Lord Aberconway. See p. 275.

To R. 'Adelaide' (votes 8 for, 1 against), from Lionel de Rothschild, Exbury. See p. 274.

To R. *Lindleyi* (votes unanimous), from Lionel de Rothschild. See p. 275.

Other Exhibits.

F. J. Hanbury, Esq., East Grinstead: R. 'Lady Alice Fitzwilliam' and R. × *fragrantissima*.

Lord Aberconway: R. *tephrapeplum*, R. 'Snowdon,' R. 'Madeline' and R. 'Agricolus.'

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Abbreviations.—Col. pls. = coloured plates; illus. = illustrated or illustrator; pls. = plates; ed. = editor, edited or edition; n.d. = no date; n.p. = no place of publication given in work; transl. = translator or translated.

When books are published in London, the place of publication is not named in the entry.

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(To be continued.)

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

CHELSEA FLOWER SHOW.

The Chelsea Flower Show was held under favourable conditions, the weather being dry and cool. Fortunately the drop in temperature which occurred several days before the Show did not damage the exhibits and accustomed us to somewhat unseasonable conditions.

As far as the flowers and plants were concerned, especially those in tents, the cool weather helped to keep them fresh.

The attendance reached higher figures than ever before; and undoubtedly from time to time there was some discomfort from overcrowding. Fellows are, however, reminded that, according to the statistics kept, the early hours in the morning and the late hours in the evening show a distinct falling off in the number of visitors, and those who desire to seek greater comfort for examining the exhibits are advised to remember this in the coming year.

It is a great satisfaction to be able to report that the Show was again visited by their Majesties the King and Queen and by many members of the Royal Family; and that it attracted much attention from foreign Horticultural Societies. This year there were large deputations from the Swedish Dendrological Society, the Horticultural Society of Lombardy, the New York Horticultural Society, and the Garden Clubs of America. And in addition there were a great number of visitors from overseas who had come over to see the Jubilee celebrations.

Particulars of the awards at the Show are given on p. cx.

SUBSCRIPTIONS.

Fellows are reminded that their friends joining the Society after July 1 and before October 1 will be required to pay only a half-year's subscription, and will receive the monthly JOURNAL commencing with the July number. Those joining after October 1 and before January 1 pay a full year's subscription which entitles them to all the privileges of Fellowship until January 1, 1937. Back numbers of the JOURNAL are always obtainable by Fellows at *gd.* a number.

CONFERENCES.

Conference on Cherries and Soft Fruits.

In the Lecture Room of the New Hall, July 16 and 17.

Programme of Conference.

TUESDAY, JULY 16, AFTERNOON, 3-5.

Lord ABERCONWAY, C.B.E., V.M.H., President of the Royal Horticultural Society, in the Chair, supported by Mr. E. A. BUNYARD, F.L.S., Chairman of the Soft Fruit Conference Committee.

- (i) "Cherries for Market Growing Purposes," by Mr. L. DOUBLEDAY, followed by Mr. E. A. BUNYARD and Mr. BRIDGES DIXON.
- (ii) "Growing Healthy Strawberries," by Mr. RONALD VINSON, followed by Dr. SWARBRICK, Mr. A. M. MASSEE, Mr. C. H. OLDHAM and Mr. T. R. C. BLOFELD.

cii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

WEDNESDAY, JULY 17, MORNING SESSION, II-I.

Mr. H. V. TAYLOR, O.B.E., B.Sc., A.R.C.S., Commissioner of Horticulture, Ministry of Agriculture and Fisheries, in the Chair.

- (i) "Nutrition and Manuring of Soft Fruits," by Dr. T. WALLACE, followed by Mr. H. GOUDE and Mr. C. D. CARTER.
- (ii) "Growing Healthy Raspberries," by Mr. R. V. HARRIS, followed by Mr. J. McINTYRE and Mr. G. C. JOHNSON.

WEDNESDAY, JULY 17, AFTERNOON SESSION, 3-5.

Sir WILLIAM G. LOBJOIT, O.B.E., J.P., V.M.H., Chairman of the Fruit and Vegetable Committee of the National Farmers' Union, in the Chair.

- (i) "Soft Fruits for the Private Garden," by Mr. A. N. RAWES, followed by Mr. R. H. HALL and Mr. T. E. TOMALIN.
- (ii) "Blackberries and like Berries for Garden Purposes," by Mr. M. B. CRANE, followed by Miss A. B. BEAKBANE.
- (iii) "The Bottling of Soft Fruits," by Miss E. M. GUNNELL.

The following additional papers will be published in the Report :

- "Varieties of Cherries," by Mr. E. A. BUNYARD.
- "Soft Fruits; Varieties under Trial at Wisley," by Mr. A. N. RAWES.
- "Varieties and Quality of Fruit required for Canning," by Mr. W. B. ADAM.
- "Gooseberries for Market," by Mr. H. C. SELBY.

A limited number of copies of the papers to be discussed at the Conference will be available in advance for those who are particularly interested and who intend being present at the Conference. Applications for these advance copies should be sent in at once.

On the occasion of this Conference there will be special competitive classes for Cherries and Soft Fruits for amateurs, the schedule of which is obtainable from the Secretary. It is hoped that many amateur growers will send in fruit for competition, and intending competitors are reminded that the closing date for entries is July 9, 1935.

In the Old Hall the Kent Branch of the National Farmers' Union will stage their Annual Show of Cherries and Soft Fruits, at which the Challenge Cup, presented by the Society to the Kent Branch, will be competed for.

Conference on Alpine Plants, 1936.

The preliminary programme for a Conference on Alpine Plants to be held in May next year is now settled.

The Conference will be spread over three days. The first afternoon, May 5, is to be devoted to two subjects: "Rock-Gardening of Different Periods in Different Countries" and "The Rise of Modern Rock Gardening and its Future." The subjects on May 6 will be "Utilization of Natural Slopes," "Utilization of Flat Sites," "Cultivation of Rock Plants in General" and "Cultivation of Difficult Plants." On May 7 discussions will take place on "The Alpine House" and "Propagation."

All Fellows interested in this Conference are asked to notify the Secretary.

International Conferences.

During the autumn of this year two International Conferences are to take place. The first, the International Botanical Congress at Amsterdam, on September 2-7; the second, the International Horticultural Congress at Rome, on September 16-21. One of the important subjects to be discussed is that of plant nomenclature, and the Council has set up a special committee to prepare lists with the object of stabilizing the nomenclature of horticultural plants. The general rules for naming of plants were published in the January number of this JOURNAL, Vol. 60, p. 39.

CALENDAR.

July 5.—According to the Calendar published in the January JOURNAL, this day was fixed for the National Sweet Pea Society's Show in the New Hall, but this has been cancelled and the Show was held at Hastings on July 3 and 4.

July 12.—A trial of all types of apparatus for Liquid Spraying, but not including spray guns, will take place at Wisley. Any Fellow who is desirous of seeing this trial is asked to notify the Director of the Gardens at Wisley in case any special arrangements have to be made. (See also special paragraph, p. civ.)

July 13.—Lily Group Garden Meeting. Arrangements are being made for a visit to Mr. C. R. SCRASE-DICKINS's garden at Coolhurst, Horsham, and Lieut.-Colonel L. C. R. MESSEL's garden at Nymans, Handcross. Further particulars may be obtained from the Secretary.

July 16 and 17.—For announcement of the Conference on Cherries and Soft Fruits, see p. ci.

July 16, 1-7.30 P.M., and July 17, 10 A.M. to 5 P.M.—Fortnightly Meeting. The competition for the best hybrid Lily, which was commenced at the Fortnightly Meeting on July 2, will be continued.

July 23, 1-7.30 P.M., and July 24, 10 A.M. to 5 P.M.—National Carnation and Picotee Society's Show. The Joint Border Carnation and Picotee Committee will meet at 3 P.M. on this occasion to judge new border Carnations.

July 24 and 25.—Demonstrations will be given, weather permitting, from 2 to 4 P.M. in the Wisley Gardens, on "Summer Pruning of Fruit Trees and Shrubs." Fellows intending to be present at these demonstrations are requested to notify the Director of the Gardens, Wisley, Ripley, Surrey, so that adequate arrangements may be made.

July 30, 1-7.30 P.M., and July 31, 10 A.M. to 5 P.M.—Fortnightly Meeting. At this Show the Clay Cup for Scented Roses will be awarded. This Challenge Cup is offered for a Rose of good form and colour, not in commerce before the current year, possessing the true old Rose scent, such as may be found in the old Cabbage or Provence Rose, in 'General Jacqueminot,' 'Marie Baumann,' 'Duke of Wellington,' 'General McArthur,' etc. The scent known as "Tea Rose" is not, for the purposes of this competition, to be counted the true old Rose scent. Not more than three different varieties may be shown by one competitor. At least three and not more than six blooms or trusses of each variety will be required, together with a plant in flower and bud. The cup will be awarded only once for the same Rose, and is open for competition to trade and amateur growers. Entries must be received not later than by the first post on Wednesday, July 24, on special forms obtainable from the Secretary.

On July 30 an additional lecture will be given in the Lecture Room of the New Hall at 3.30 P.M., when Mr. F. R. LONG, Associate of Honour of this Society, and President of the Association of Superintendents of Parks and Gardens, South Africa, will address the Fellows of the Society on the South African Flora. The lecture will be illustrated with lantern slides. Will Fellows kindly make a note of this lecture in their diaries?

August 13, 1-6 P.M.—Fortnightly Meeting. Gladioli may be expected to be seen at their best, and there will be a competition for the Foremarke Cup. This cup is offered for twenty spikes of named Gladioli in not less than ten varieties and not more than two spikes of any one variety. The competition is open to trade and amateur growers, and entries must be received not later than by the first post on Wednesday, August 7.

At 3.30 P.M. on Tuesday afternoon, August 13, in the Lecture Room of the New Hall, the Hon. Mrs. RYDER will speak on "The Flowers of the Karroo." The lecture will be illustrated by lantern slides.

August 13, 1-7.30 P.M., and August 14, 10 A.M. to 5 P.M.—British Gladiolus Society's Show to be held in the Old Hall.

August 27, 1-6 P.M.—Fortnightly Meeting. Dahlias will now be coming into prominence, and there will also be the first of the autumn Roses, and later Gladioli.

For the encouragement of the autumn-flowering plants for the rock garden, there will be the last competition for the Sewell Medal for Alpines, and on this occasion it will be confined to amateurs' exhibits. The conditions governing the competition will be found on page 30 of the January number of the JOURNAL.

At 3.30 P.M. in the afternoon of August 27, in the Lecture Room of the New Hall, Mr. BEN WELLS, Junior, will speak on "New Herbaceous Plants."

August 30, 2.30-8 P.M., and August 31, 10 A.M. to 6 P.M.—London Allotments and Gardens Show Society's Exhibition.

August 30 and 31.—The Honorary Secretary of the Southgate and District Horticultural Society has asked that notice might be given to the effect that any Fellow of the Royal Horticultural Society wishing to visit the Southgate show will be admitted free on showing his ticket. For particulars please apply to the Hon. Secretary, Southgate and District Horticultural Society, Town Hall, Palmers Green, N. 13.

SILVER JUBILEE MEDAL FOR AFFILIATED SOCIETIES.

In commemoration of Their Majesties' Silver Jubilee, the Council has decided to offer to Affiliated Societies a specially designed Silver Medal in place of the Banksian Medal, which is usually presented by Affiliated Societies as the premier award at their shows. The conditions under which this Medal will be presented may be obtained on application to the Secretary, when a copy of last year's schedule of the Affiliated Society in question should be forwarded.

TRIAL OF SPRAYING MACHINES FOR LIQUIDS FOR GARDENS, ORCHARDS AND FIELDS.

A trial of all types of apparatus for Liquid Spraying (but not including spray guns) is being arranged and will take place on Friday, July 12, 1935.

The trial will cover apparatus suitable for the following classes of work :

- (a) Hand-work in small gardens, *i.e.* syringes of all types, continuous-pumping and pneumatic sprayers and diffusers, bucket and similar light sprayers.
- (b) Large gardens, market gardens, bush-fruit plantations and large glass-houses—*i.e.* continuous-pumping and pneumatic knapsack sprayers, barrel and tank sprayers and headland sprayers.
- (c) Fruit farms and large market gardens—*i.e.* power sprayers for wet spraying.

In judging the machines their suitability for use with the following will be taken into account :

- (a) Nicotine and similar washes, including soap and oil emulsions.
- (b) Bordeaux mixture.
- (c) Arsenical washes in suspension—lead arsenate.
- (d) Caustic winter washes.
- (e) Tar-oil washes.
- (f) Lime-sulphur washes.
- (g) Acid washes.

Other considerations will be :

General Construction.

- (a) Simplicity and accessibility of parts, particularly pump and valves.
- (b) Ease of working.
- (c) Ease of repair and replacement of valves, washers, pump packing, etc.
- (d) Agitating devices.
- (e) Durability.
- (f) Power.
- (g) Portability or ease of traction.

Nozzles.

- (a) Fineness of spray, penetration and covering power.
- (b) Simplicity of construction.
- (c) Ease of clearing choked nozzles.

Cost of apparatus, accessories and spare parts.

White Fly Parasite.

The parasite of the greenhouse white fly, *Encarsia formosa*, has proved extremely effective in checking the increase of this pest under glass where it has been introduced, and large numbers have been distributed during the past few years. The demand has become so great that in order to meet in a measure the cost of maintaining the parasite over the difficult winter months and packing and despatching it, the Council has fixed a charge of 2s. 6d. for a supply for a small house and 5s. for a large house, and applications for it should be accompanied by the sum named. It is useless to introduce it to houses until the average temperature is about 70° F. Early application should be made since the supply is limited, and it is hoped that Fellows who have found it successful will distribute it in their neighbourhood.

EXAMINATIONS.

The attention of Fellows is drawn to one of the important features of the Society's educational work—the examinations held each year—and the following results should be of interest to all.

These examinations have been held for a great number of years and have undoubtedly been of great assistance in raising the standard of education in the gardening world, and it is satisfactory to report that this year the number of candidates exceeded that of 1934 by 300.

In the General Examination for Senior candidates, 239 candidates were awarded the Society's certificate, and a Silver-Gilt Medal was won by Mr. Harry W. L. Hutchings, of 5 St. Martha's Cottages, Peaslake, who was first. Some very good papers were done by candidates in the Junior Examination for those under 18, and 105 certificates were gained. The Silver Medal for the candidate placed first went to Mr. John Redler, of The Somerset Farm Institute, Cannington, Bridgwater.

The Teachers' Preliminary Examination in School and Cottage Gardening, which is held with the object of encouraging the teaching of gardening in schools, showed very satisfactory results. Two hundred and fifty-two certificates were gained and a Silver-Gilt Medal was awarded to Miss Muriel G. Hodgman, of Keers Green, Aythorpe Roding, who was first. Many of the teachers who took this examination entered also for the General Examination, showing their keen interest in gardening.

The results of the Teachers' Advanced Examination, and of the National Diploma in Horticulture, will be published at a later date. Candidates taking these more advanced examinations attend a practical and viva voce Examination at the Society's Gardens at Wisley in June each year.

Further, the attention of the Fellows is drawn to the British Floral Art Diploma, an examination to encourage and improve the art of arranging flowers, which was established in 1933. This examination is open to both sexes, professionals or otherwise, and forty-five Diplomas have been awarded since the examination was started, five of these being gained by candidates at the examination held last March. The work done by the candidates at these examinations is always on view to Fellows and the public at the close of the examination, and it is hoped that as it becomes better known more Fellows will visit the Hall, and see the many beautiful bouquets, wreaths and other floral decorations made by the candidates.

The syllabus of Horticultural Examinations for 1936 and also for the British Floral Art Diploma may be obtained from the Society's offices in Vincent Square.

NATIONAL ROSE SOCIETY'S SUMMER SHOW.

Fellows will have heard with regret that owing to the effects of the severe frosts in May last, the Council of the National Rose Society had to postpone the great Summer Show usually held at Chelsea at the end of June. It is now proposed that the Show should be held in both Halls of this Society on September 13 and 14.

The Fellows and Associates of the Society will be admitted to this Show free of charge, on presentation of their tickets.

WISLEY GARDENS.

The frosts of May 17, when 14° was registered on the grass, and again 13° on the 18th, caused extensive damage to a great variety of plants. The screen minimum of 5° of frost is actually the lowest recorded at Wisley in May since observations were commenced in 1904. The minimum on the grass—14°—has been lower in May on two occasions, 1927 and 1929, but these low temperatures were recorded on May 1 in each of these years. In many the result has been the complete defoliation of the affected plants as well as the destruction of flowers in the bud stage. Consequently there will be a scarcity of bloom during the month of June in many genera and species which are generally to be depended on to make a good display of colour during that month.

The plants on the Rock Garden to which attention may be called include *Dianthus*, *Campanula*, *Geranium*, *Phyteuma*, *Wahlenbergia*, *Primula*, *Meconopsis* and *Lithospermum*. On the Scree mention may be made of dwarf *Pentstemons*, *Gentians*, *Triptilion spinosum*, *Anacyclus formosus*, *Phyteuma pauciflorum*, *Phlox mesoleuca*, *Gentista delphinensis*, *Lewisia columbiana rosea*, and other genera preferring this position. There are still many plants flowering in the Alpine House which will repay well a visit by those interested in this class of plant, including *Saxifragas*, *Ramondia Myconi* and the pink Wisley form, *R. Heldreichii*, and numerous others suitable for growing under these conditions.

Among the plants in the Wild Garden the stronger growing *Primulas* of the *Candelabra* type will be abundant, while the Welsh Poppy, which forms a ground-work among the *Lilium giganteum*, gives a good display. Here also may be found

Omphalogramma vinciflora, *Lilium rubellum*, *L. pyrenaicum*, *Meconopsis betonicifolia*, *M. superba*, *M. grandis* and *M. regia*.

Among the flowering shrubs in Seven Acres will be Genistas, Spiraeas, Buddleias, Escallonias, and Hypericums, with Deutzia and Philadelphus in variety wherever they have escaped the ravages of frost. Rose species will also be found worth a visit at the north end of the garden along the riverside walk. It is yet too early for the flowering of many Ericas, but such species as *E. tetralix*, *E. vagans* and *E. cinerea* in their earliest varieties may be expected. Water Lilies in the ponds will also be in bloom, while a visit to the Herbaceous Border will—although rather early in the season—also be of interest.

Of the various Trials that of the Sweet Peas in numerous varieties will be particularly worth seeing. Other Trials include Delphiniums, Lupins, Oenotheras, Gladioli, Verbenas, and Petunias, which in their various stages of growth will attract those interested.

RHODODENDRON SHOW.

APRIL 30, 1935.

JOINT RHODODENDRON COMMITTEE (Rhododendron Show).—Mr. E. H. WILDING in the Chair, and fifteen other members present.

Awards Recommended :—*First-class Certificate.*

To *R. 'Coreta'* (votes unanimous), from Lord Aberconway, Bodnant. See p. 323.

To *R. repens* (votes unanimous), from J. B. Stevenson, Esq., Tower Court, Ascot. See p. 325.

Award of Merit.

To *R. Davidsonianum* (pink form) (votes 7 for, 2 against), from Lord Aberconway, Bodnant. See p. 323.

To *R. crinigerum* (votes 13 for), from Lionel de Rothschild, Esq., Exbury. See p. 323.

To *R. pectinatum* (votes 10 for, 2 against), from Lionel de Rothschild, Esq. See p. 325.

To *R. 'W. Leith'* (votes unanimous), from Admiral A. W. Heneage-Vivian, Swansea. See p. 326.

To *R. 'Blue Diamond'* (votes 11 for), from J. J. Crosfield, Esq., Embley Park, Hants. See p. 321.

To *R. deleiense* (votes 7 for, 2 against), from Lord Swaythling, Townhill Park, Southampton. See p. 324.

To *R. pumilum* (votes unanimous), from Lord Swaythling. See p. 325.

To *R. megeratum* (votes unanimous), from Lord Swaythling. See p. 325.

Other Exhibits.

Capt. Carlyon, Tregrehan, Cornwall : *R. 'Tregrehanii.'*

Sir John Ramsden, Gerrards Cross : *R. sinogrande*, *R. 'Shilsoneri.'*

Sir H. R. Cayzer, Basingstoke : *R. 'Asteroid.'*

Lt.-Col. Stephenson R. Clarke, Borde Hill, Sussex : *R. repens* var. *chamae-thauma*.

Capt. A. M. Talbot Fletcher, Port Talbot : *R. fulvum*.

Lord Aberconway, Bodnant : *R. arboreum* var. *zeylanicum* and *R. supra-nubium*.

Lionel de Rothschild, Esq. : *R. 'Susan'* and *R. 'Margaret Bean.'*

Col. G. H. Loder, High Beeches, Handcross, Sussex : *R. auritum*.

The Marquess of Headfort, Kells, Co. Meath, Ireland : *R. Clementinae*.

The Earl of Stair, Lochinch Castle : *R. arizelum*.

Lord Swaythling : *R. 'Gladys'* and *R. imperator*.

Collingwood Ingram, Esq., Benenden, Kent : *R. 'Yanchart.'*

GENERAL MEETING.

MAY 8, 1935.

A lecture was given by Lady ROCKLEY, C.B.E., on "Wild Flowers of the Dominions" (p. 285).

Chairman, The Rt. Hon. Viscount ULLSWATER, Vice-President.

A discussion on the Cultivation of Lilies in Pots took place among members of the Lily Group and will be reported in the Lily Year Book, 1935.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

Viola Patrinii.—Mr. Cotton reported that the *Viola* shown at the last meeting from Mr. Collingwood Ingram was *V. Patrinii*.

Pulsatilla Halleri.—Foliage of an Anemone shown by Lady Stanley on April 2 was now before the Committee, and it proved to be that of *Pulsatilla Halleri*.

Ornithogalum naturalized.—Mr. Jackson showed an *Ornithogalum* (*O. umbellatum*) which he reported as naturalized near Mildenhall in Suffolk.

Root prassure.—Mr. Gurney Wilson raised the question of water supply to cut flowers of Orchids, and some discussion took place on the part played by root pressure and by the free intake of water to supply that lost by transpiration. It was pointed out that the latter may frequently result in greater quantities being absorbed.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and eleven other members present.

Exhibit.

The Rev. A. A. Kerridge, Dickleboro', Diss : seedling Apple.

FLORAL COMMITTEE A.—Mr. J. M. BRIDGEFORD in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Kelway, Langport, for Tree Paeonies.

Silver Floral Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Mr. J. Douglas, Great Bookham, for Auriculas.

To Messrs. Engelmänn, Saffron Walden, for Carnations, Pansies, etc.

Banksian Medal.

To Mr. F. J. Bell, Whitley Bay, for Violas.

To Messrs. S. Low, Enfield, for Carnations.

To Orpington Nurseries, Orpington, for Irises.

To Messrs. Simmons, Finchley, for Violas.

Selected for trial at Wisley.

Papaver nudicaule, 'Kelmscott Strain,' from Mr. E. J. Barker, Ipswich.

Other Exhibits.

Messrs. Clark, Dover : Auriculas, Tulips, etc.

Messrs. John & A. H. Crook, Beaconsfield : Polyanthus.

Mr. A. Hansen, New Barnet : Auricula 'The Gnome.'

Messrs. Harkness, Leeming Bar : Polyanthus.

Mr. S. Ogg, Swanley : Dahlias.

Messrs. Stark, Fakenham : Polyanthus, Aubrietias.

Messrs. Wakeley, London : Lily of the Valley, Myosotis, etc.

Mr. W. A. Watts, St. Asaph : Auricula 'Bishop.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended :—

Silver Flora Medal.

To Mr. R. C. Notcutt, Woodbridge, for flowering shrubs.

To Messrs. Waterer, Bagshot, for Rhododendrons.

Silver Banksian Medal.

To Messrs. Casburn, Bedford & Page, Cambridge, for alpine plants.

To Messrs. Cheal, Crawley, for flowering shrubs.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Mr. E. Ladhams, Elstead, for flowering shrubs and hardy plants.

To Messrs. Stuart Low, Enfield, for greenhouse shrubs.

To Messrs. Russell, Richmond, for Rhododendrons.

Flora Medal.

To Messrs. Neale, Newhaven, for Gazanias, Mesembryanthemums and Cacti.

To Messrs. Waterer, Bagshot, for alpine plants.

Banksian Medal.

To Messrs. Baker, Codsall, for Japanese Azaleas and alpine plants.

To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for flowering shrubs.

To Messrs. Cheal, Crawley, for herbaceous and alpine plants.

To Messrs. Elliott, Stevenage, for alpine plants.

To Mr. G. E. Welch, Cambridge, for alpine plants.

Award of Merit.

To *Paeonia tomentosa* as a hardy flowering plant (votes 16 for), from R. G. Berkeley, Esq., Warley Place, Brentwood. See p. 321.

To *Ranunculus asiaticus*, orange form, as a hardy flowering plant (votes unanimous), from G. P. Baker, Esq., Sevenoaks. See p. 321.

Other Exhibits.

A. Burkwood, Esq., Poole : *Malus* × *Burkwoodii*.

The Curator, Chelsea Physic Garden : *Eranthemum cinnabarinum*.

Mr. A. Corderoy, Eltham : alpine plants.

Dorset Nurseries, Blandford : alpine plants.

Mr. A. Hansen, New Barnet : alpine plants.

Messrs. Hillier, Winchester : *Arctostaphylos diversifolia*, *Vaccinium nummularia*.

Miss Hopkins, Coulsdon : rock plants.

Edward Howarth, Esq., Kirdford : *Piptanthus nepalensis*.

Collingwood Ingram, Esq., Benenden : *Omphalodes cappadocica*.
 Mr. H. G. Longford, Abingdon : alpine plants and Tulips.
 Messrs. Maxwell & Beale, Broadstone : alpine plants.
 Messrs. Redgrove & Patrick, Sevenoaks : shrubs and alpine plants.
 Mr. J. Robinson, Eltham : alpine plants.
 Wm. Robinson, Esq., East Grinstead : *Clematis marata*, *C. alpina grandiflora*.
 The Hon. Mrs. Sebag-Montefiore, Plymouth : *Grevillea longifolia*, *Primula pulchella*, *P. muliensis*.
 Mr. R. Colpoys Wood, West Drayton : shrubs.
 Mr. G. Wood, Ashted : hardy plants.

ORCHID COMMITTEE.—Col. STEPHENSON R. CLARKE in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for a group.

First-class Certificate.

To *Odontoglossum* × 'Belus' var. 'Leviathan' (*crispum* × 'Marcella') (votes 8 for, 4 against), from Messrs. Charlesworth, Haywards Heath. See p. 320.

Other Exhibit.

Messrs. Stuart Low, Jarvis Brook, for a group.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Barr, Covent Garden, for an exhibit of Tulips.

Silver Flora Medal.

To Rev. Canon Rollo Meyer, Watton-at-Stone, for an exhibit of Tulips.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Tulips.

Silver Banksian Medal.

To Mr. W. A. Watts, St. Asaph, for an exhibit of Tulips.

To The Bronwyfa Fruit and Bulb Farm, St. Asaph, for an exhibit of Tulips.

Lindley Medal.

To Sir Daniel Hall, K.C.B., LL.D., F.R.S., John Innes Horticultural Institution, Merton, for an exhibit of seedling Tulips of his own raising.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and ten other members present.

Awards Recommended :—

First-class Certificate.

To *Rhododendron concatenans* (votes unanimous), from Lt.-Col. L. C. R. Messel, O.B.E., Nymans, Handcross, Sussex. See p. 322.

Award of Merit.

To *R. calostrotum* (votes 8 for), from Lt.-Col. L. C. R. Messel, O.B.E., Nymans, Handcross, Sussex. See p. 322.

To *R. xanthocodon* (votes 9 for), from Lionel de Rothschild, Esq., Exbury.

To *R. 'Jubilee Queen'* (votes unanimous), from Lady Loder, Leonardslee, Horsham, Sussex. See p. 324.

Selected for Trial at Exbury.

R. 'Penelope' (votes 6 for) and *R. 'Apollo'* (votes unanimous), both from Messrs. Waterer, Sons & Crisp, Bagshot, Surrey.

Other Exhibits.

R. E. Horsfall, Esq., Littleworth Cross, Farnham, Surrey : R. 'Littleworth Cream' and R. 'Maurice Daffarn.'

The Hon. Mrs. Sebag-Montefiore, Thorn, Wembury, Devon : *R. 'Royyun.'*

Lionel de Rothschild, Esq., Exbury : *R. 'Cassiope.'*

Messrs. Waterer, Sons & Crisp, Bagshot, Surrey : *Azalea 'Jubilee.'*

Lady Loder, Leonardslee, Horsham, Sussex : *R. 'Reversi.'*

JOINT IRIS COMMITTEE.—Major F. C. STERN, M.C., in the Chair, and ten other members present.

Award Recommended :—

Award of Merit.

To *Iris 'Susiana'* (votes unanimous) for general garden use, from C. W. Christie-Miller, Esq., Swyncombe House, Swyncombe. See p. 320.

CX PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Other Exhibit.

Major F. C. Stern, M.C., Highdown, Goring-by-Sea : Iris 'Hoogiana' (A.M. 1919).

CHELSEA SHOW.

MAY 22, 23 AND 24, 1935.

Held in the Grounds of the Royal Hospital, Chelsea.

The following accepted the Council's invitation to assist in judging the exhibits :—

H. G. ALEXANDER, V.M.H.; D. ALLAN; G. P. BAKER, V.M.H.; F. R. S. BALFOUR, M.A., D.L., J.P., V.M.H.; N. F. BARNES, V.M.H.; W. J. BEAN, I.S.O., V.M.H.; D. BLISS, V.M.H.; Canon A. T. BOSCAWEN, V.M.H.; W. BUTT; D. CAMPBELL; C. W. CHRISTIE-MILLER; J. COMBER; T. H. COOK; J. COUTTS, V.M.H.; D. B. CRANE; C. H. CURTIS, F.L.S., V.M.H.; A. DAWKINS; H. DICKSON; A. G. ELLWOOD; R. S. GARDEN; MARK FENWICK, J.P.; W. HALES, A.L.S., V.M.H.; F. J. HANBURY, F.L.S., F.R.E.S., V.M.H.; The Marquess of HEADFORT; W. J. HEPBURN; D. INGAMILLS; The Hon. ROBERT JAMES; A. J. JONES; F. JORDAN, V.M.H.; A. W. METCALFE; Sir FREDERICK MOORE, M.A., F.L.S., V.M.H.; C. G. A. NIX, V.M.H.; W. J. PENTON; G. L. PILKINGTON; F. G. PRESTON; F. C. PUDDLE; C. P. RAFFILL; Dr. H. ROGER-SMITH; V. L. ROSCOE; F. J. ROSE; P. ROSENHEIM; LIONEL DE ROTHSCHILD, O.B.E., V.M.H.; P. K. SANDER; O. C. A. SLOCOCK; H. SMITH; T. STEVENSON; C. C. TITCHMARSH, N.D.H.; E. WHITE, V.M.H.; J. WILSON; G. H. WRIGHT.

LIST OF AWARDS.

The Sherwood Challenge Cup, for the most meritorious exhibit in the Show.

To Messrs. Sutton, Reading, for an exhibit of greenhouse plants from seeds.

The New York Horticultural Society's Trophy, presented by the Horticultural Society of New York and offered for award for the best exhibit of trees and shrubs shown in the open.

To Messrs. Hillier, Winchester.

The Jubilee Trophy, to celebrate the 25th anniversary of His Majesty's accession to the throne, for award outright for the best exhibit shown by an amateur.

The trophy is accompanied by a prize of £20 to the exhibitor's gardener.

To Lionel de Rothschild, Esq., Exbury, Southampton, for Rhododendron species and Rhododendron hybrids raised at Exbury (grs. Mr. F. Hanger and Mr. R. Findlay).

The Cain Challenge Cup. The winner of the Jubilee Trophy also receives the Cain Challenge Cup, which is offered for award annually for the best exhibit shown by an amateur.

To Lionel de Rothschild, Esq.

Orchid Challenge Cup, for the best group of Orchids shown by an amateur in a space not exceeding 100 square feet.

To N. Prinsep, Esq., Pevensey Bay (gr. Mr. A. Merry).

Orchid Challenge Cup, for the best group of Orchids shown by an amateur in a space not exceeding 60 square feet.

To M. L. Wells, Esq., Chiddingfold (gr. Mr. R. Buckman).

Sutton Vegetable Cup, for the best group of vegetables shown by an amateur.

To Cheadle Royal Mental Hospital.

Orchid Trophy, for the best twelve Orchids exhibited by an amateur.

To E. R. Ashton, Esq., Tunbridge Wells (gr. Mr. Dunster).

Gold Medal.

To Lionel de Rothschild, Esq. (grs. Mr. F. Hanger and Mr. R. Findlay), Southampton, for Rhododendron species and Rhododendron hybrids raised at Exbury.

To Messrs. Allwood, Haywards Heath, for Carnations, Pinks, and Dianthus hybrid.

To Messrs. R. Bolton, Birdbrook, for Sweet Peas.

To Messrs. Barr, Covent Garden, for Tulips.

To Messrs. C. Engelmann, Saffron Walden, for Carnations.

To Messrs. Laxton Bros., Bedford, for Strawberries.

To Lionel de Rothschild, Esq. (Orchid grower, Mr. B. Hills), Southampton, for Cymbidiums, chiefly Exbury hybrids.

To Baron Bruno Schröder (Orchid grower, Mr. J. E. Shill), Englefield Green, for Orchids.

To Messrs. Alex. Dickson, Newtownards, for Roses.

To Messrs. Hillier, Winchester, for trees and shrubs.

- To Messrs. G. Jackman, Woking, for Clematis.
- To Messrs. L. R. Russell, Richmond, Surrey, for stove and greenhouse plants.
- To Messrs. Charlesworth, Haywards Heath, for Orchids.
- To Messrs. McBean, Cooksbridge, for Orchids.
- To Mr. A. Gavin Jones, Letchworth, for formal garden.
- To Dartington Hall, Totnes, for rock garden.
- To the Lord Aberconway, Bodnant, Tal-y-Cafn (gr. Mr. F. C. Puddle), for hybrids raised at Bodnant and uncommon plants.
- To Messrs. Sutton, Reading, for greenhouse plants from seeds.
- To Messrs. R. Wallace, Tunbridge Wells, for mixed group of Lilies and other bulbous plants, Rhododendrons, Azaleas and Irises.

Silver Cup.

- To Messrs. Dobbie, Edinburgh, for Tulips.
- To Messrs. G. Bunyard, Maidstone, for Apples.
- To Cheadle Royal Mental Hospital (gr. Mr. C. E. Mason), Cheadle, for vegetables.
- To Sir Jeremiah Colman, Bt., Gatton Park (Orchid grower, Mr. B. F. Perfect), for Orchids.
- To Messrs. A. Charlton, Rotherfield, for trees and shrubs, including Japanese Maples.
- To Messrs. J. Waterer, Sons & Crisp, Bagshot, for trees and shrubs.
- To Messrs. H. G. Alexander, Tetbury, for Orchids.
- To Messrs. Armstrong & Brown, Tunbridge Wells, for Orchids.
- To Messrs. Sanders, St. Albans, for Orchids.
- To Messrs. Clarence Elliott, Stevenage, for rock garden.
- To Messrs. Blackmore & Langdon, Bath, for mixed group of Begonias and Delphiniums.
- To Messrs. Carters' Tested Seeds, Raynes Park, for a mixed group of florists' flowers, annuals, etc.

Silver-gilt Flora Medal.

- To Messrs. J. Waterer, Sons & Crisp, Bagshot, for Rhododendrons.
 - To Messrs. R. H. Bath, Wisbech, for Tulips.
 - To Messrs. Wakeley, Bankside, S.E., for Tulips.
 - To F. J. Hanbury, Esq. (Orchid grower, Mr. S. Farnes), East Grinstead, for Orchids.
 - To N. Prinsep, Esq. (gr. Mr. A. Merry), Pevensey Bay, for Orchids.
 - To Messrs. Dobbie, Edinburgh, for Sweet Peas.
 - To Messrs. Ben. R. Cant, The Old Rose Gardens, Colchester, for Roses.
 - To Messrs. Frank Cant, Braiswick Rose Gardens, Colchester, for Roses.
 - To Messrs. Chaplin Bros., Waltham Cross, for Roses.
 - To Messrs. John Peed, West Norwood, S.E. 27, for greenhouse plants.
 - To Donard Nursery Co., Newcastle, co. Down, for shrubs.
 - To Mr. R. C. Notcutt, Woodbridge, for trees and shrubs, including Lilacs and Brooms.
 - To Messrs. L. R. Russell, Richmond, Surrey, for trees and shrubs.
 - To Percy S. Cane, Esq., Westminster Palace Gardens, S.W., for garden.
 - To Messrs. J. Cheal, Crawley, for formal garden.
 - To Messrs. Wm. Cutbush, Barnet, for garden.
 - To Messrs. B. Sunley, Brentford, for garden.
 - To Messrs. R. Wallace, Tunbridge Wells, for garden.
 - To Messrs. J. Waterer, Sons & Crisp, Bagshot, for formal garden.
 - To Messrs. Black & Flory, Slough, Bucks, for Orchids.
 - To Hocker Edge Gardens, Cranbrook, for rock garden.
 - To Messrs. Pulham, Newman Street, W., for rock garden.
 - To Mr. G. G. Whitelegg, Chislehurst, for rock garden.
 - To Messrs. Bakers, Codsall, for mixed group of Delphiniums, Lupins and other herbaceous plants.
 - To Messrs. Bees, Chester, for a mixed group of herbaceous and rock garden plants.
 - To Messrs. M. Prichard, Christchurch, for herbaceous plants.
 - To Messrs. J. Waterer, Sons & Crisp, Twyford, for mixed group of herbaceous plants, Lilies and Tulips.
- Silver-gilt Banksian Medal.*
- To Messrs. J. R. Pearson, Lowdham, for Tulips.
 - To M. L. Wells, Esq., Chiddingfold, for Orchids.
 - To Knap Hill Nursery, Woking, for Rhododendrons.
 - To W. G. Theobald, Esq. (gr. Mr. R. Baker), for Cotyledons and Echeverias.
 - To Messrs. Dobbie, Edinburgh, for Antirrhinums.
 - To Mr. Elisha J. Hicks, Hurst, for Roses.
 - To Mr. James Douglas, Edenside, for Auriculas.

- To Messrs. Hillier, Winchester, for trees and shrubs.
- To Mr. John Klinkert, Richmond, Surrey, for topiary work.
- To Mr. W. J. Marchant, Wimborne, for mixed group of trees and shrubs, including heathers.
- To Mr. R. C. Notcutt, Woodbridge, for Lilacs.
- To Messrs. G. Reuthe, Preston, for shrubs.
- To Messrs. Gilliam, Croydon, for formal garden.
- To Messrs. Wm. Wood, Taplow, for formal garden.
- To Messrs. Stuart Low, Jarvis Brook, for Orchids.
- To Mr. James Douglas, Great Bookham, for border Carnations.
- To Mr. W. A. Constable, Tunbridge Wells, for Lilies.
- To Messrs. W. Artindale, Sheffield, for a mixed group of Eremurus and Lilies.
- To Mr. F. J. Bell, Whitley Bay, for Pansies and Violas.
- To Messrs. C. Engelmann, Saffron Walden, for Pansies.

Silver Flora Medal.

- To Mr. G. G. Whitelegg, Chislehurst, for Irises.
- To Messrs. G. Bunyard, Maidstone, for Irises.
- To Messrs. Walter Blom, Cranleigh, for Tulips and other bulbous plants.
- To Messrs. Daniels, Norwich, for Tulips.
- To Rev. Canon H. Rollo Meyer, Watton-at-Stone, for Tulips.
- To Mr. T. M. Endean, Laindon, for Cacti and succulent plants.
- To Lady Emsley Carr, Walton-on-the-Hill (gr. Mr. J. T. Doe), for Carnations.
- To Messrs. Toogood, Southampton, for a mixed group of Stocks, Schizanthus and Mignonette.
- To Messrs. J. Cheal, Crawley, for trees and shrubs.
- To Messrs. D. Stewart, Ferndown Nurseries, near Wimborne, for Rhododendrons, Azaleas and other shrubs.
- To Messrs. R. Veitch, Aliphington, for trees and shrubs.
- To Sir Gomer Berry, Bt. (gr. Mr. C. G. W. Poulter), Farnham Royal, for stove and greenhouse plants.
- To E. James, Esq. (gr. Mr. M. H. Lines), Chichester, for *Richardia Pentlandii*.
- To Mrs. J. T. Wigan, Chelmsford (gr. Mr. W. G. Todd), for Schizanthus and other stove and greenhouse plants.
- To Messrs. W. E. Th. Ingwersen, Sharpthorne, E. Grinstead, for rock garden.
- To Mr. Ian G. Walker, South Godstone, for rock garden.
- To Mr. Amos Perry, Enfield, for mixed group of ferns, tree Pæonies, bulbous and herbaceous plants.
- To The Brookside Nurseries, Headington, for rock-garden plants.
- To Messrs. Casburn, Bedford & Page, Trumpington, for rock-garden plants.
- To Messrs. Clarence Elliott, Stevenage, for rock-garden plants.
- To Messrs. W. E. Th. Ingwersen, Sharpthorne, E. Grinstead, for rock-garden plants.
- To Messrs. Maxwell & Beale, Broadstone, for rock-garden plants.
- To Messrs. Oliver & Hunter, Moniaive, Dumfriesshire, for Primulas, Meconopsis, Lilies and rock-garden plants.
- To Messrs. M. Prichard, Christchurch, for rock-garden plants.
- To Messrs. G. Reuthe, Preston, for rock-garden plants.
- To Messrs. J. Waterer, Sons & Crisp, Twyford, for rock-garden plants.
- To Mr. G. E. Welch, Cambridge, for rock-garden plants.
- To Messrs. Carter Page, London Wall, for Dahlias.
- To Messrs. Dobbie, Edinburgh, for Dahlias.
- To Messrs. E. Webb, Stourbridge, for greenhouse plants and annuals.

Silver Banksian Medal.

- To Mr. R. G. Cuthbert, Cranleigh, for Azaleas.
- To Messrs. W. T. & H. E. Neale, Newhaven, for succulent plants and Gazanias.
- To Messrs. R. Gill, Falmouth, for Rhododendrons and other shrubs.
- To Messrs. Stuart Low, Enfield, for mixed group of Australian shrubs, Hippeastrums and other greenhouse plants.
- To Mr. James MacDonald, Harpenden, for grass garden.
- To Mr. Ernest Dixon, Putney, S.W., for rock garden.
- To Messrs. Robert Green, Crawford Street, W. 1, for Bay trees.
- To Messrs. Casburn, Bedford & Page, Trumpington, for trough gardens.
- To Dartington Hall, Totnes, for alpine-house plants.
- To Mr. G. H. Dalrymple, Bartley, Southampton, for mixed group of Primulas and Meconopsis.
- To Hocker Edge Gardens, Cranbrook, for alpine-house plants.
- To Messrs. Allwood, Haywards Heath, for Pinks.
- To Mrs. D. Bucknall, Creagh Castle, Doneraile, co. Cork, for *Habranthus pratensis*.

Silver Hogg Medal.

To Messrs. T. Rivers, Sawbridgeworth, for fruit trees in pots.

Silver Knightian Medal.

To Messrs. Fogwills, Guildford, for vegetables.

Flora Medal.

To Bronwylfa Fruit and Bulb Farm, St. Asaph, for Tulips.

To Messrs. H. Prins, Wisbech, for Tulips.

To Studley College, Warwickshire, for Stocks.

To Messrs. Watkins & Simpson, Drury Lane, W.C., for mixed group of Stocks, Ranunculi, Calceolarias and Nierembergias.

To Messrs. C. Engelmann, Saffron Walden, for Zinnias.

To Mr. C. Gregory, Chilwell, for Roses.

To Messrs. D. Prior, Colchester, for Roses.

To Messrs. Bakers, Codsall, for trees and shrubs.

To Messrs. J. Burley, Putney, for formal gardens.

To Messrs. Wm. Cutbush, Barnet, for Roses.

To Mr. R. Aireton, Poole, for trees and shrubs.

To Messrs. Hillier, Winchester, for rock-garden plants.

To Hocker Edge Gardens, Cranbrook, for trough gardens.

To Messrs. W. H. Rogers, Bassett, Southampton, for rock-garden plants.

To Messrs. Hewitt, Solihull, for Delphiniums, Astilbes, Thalictrums and other herbaceous plants.

To Mr. Stuart Ogg, Swanley, for Dahlias.

To Messrs. Barr, Covent Garden, for mixed group of herbaceous and rock-garden plants.

Banksian Medal.

To Mr. G. G. Whitelegg, Chislehurst, for Azaleas.

To Orpington Nurseries, Orpington, for Irises.

To C. G. Osborne, Esq. (gr. Mr. J. E. Jones), Marlow-on-Thames, for Orchids.

To Ashington Nurseries, Ashington, for Carnations.

To Messrs. Stuart Low, Enfield, for Carnations.

To Messrs. A. J. & C. Allen, Norwich, for Roses.

To Messrs. W. Easlea, Leigh-on-Sea, for Roses.

To Messrs. Hillier, Winchester, for Rose species.

To Messrs. George Prince (Oxford), Longworth, for Roses.

To Messrs. Burkwood & Skipwith, Kingston, for trees and shrubs.

To Messrs. Gurtzen & Ritson, Three Bridges, for mixed group of Conifers, shrubs and Roses.

To Messrs. Neves Hollamby's Nurseries, Groombridge, for trees and shrubs, including Rhododendrons.

To Messrs. J. Scott, Merriott, for shrubs.

To Messrs. T. Yano, Granville Place, W., for Japanese dwarf trees.

To Yokohama Nursery Co., Kingsway, W.C. 2, for Japanese dwarf trees and Kurume Azaleas.

To Mr. R. J. Case, Taunton, for Zonal Pelargoniums.

To Mr. G. H. Dalrymple, Bartley, for Auriculas.

To Mr. A. Dawkins, King's Road, S.W. 10, for Schizanthus.

To Messrs. C. Engelmann, Saffron Walden, for Gerberas.

To Mr. H. J. Jones, Lewisham, S.E. 13, for Hydrangeas.

To Swanley College, Kent, for Schizanthus hybrids and Aquilegias.

To Mr. A. J. Simon, Finchley Road, N.W. 3, for formal garden.

To Messrs. Mansell & Hatcher, Rawdon, for Orchids.

To Messrs. J. C. Allgrove, Langley, for *Rosa Hugonis*.

To Lady Yule (gr. Mr. H. Rideout), St. Albans, for greenhouse plants.

To Alpine Nurseries, Wimborne, for rock-garden plants.

To Messrs. Bakers, Codsall, for rock-garden plants.

To Messrs. Clarence Elliott, Stevenage, for trough gardens.

To Messrs. J. Robinson, Eltham, for rock-garden plants.

To Messrs. Wm. Wood, Taplow, for rock-garden plants.

To Messrs. Allwood, Haywards Heath, for Dianthus hybrid.

To Mr. E. Clegg, Dewsbury, for mixed group of Pansies, Violas and Dahlias.

To Highfield Nursery Co., Enfield, for Violas.

To Mr. J. B. Riding, Chingford, for Dahlias.

To Messrs. J. C. Allgrove, Slough, for mixed group of shrubs and herbaceous plants.

To Mr. Ernest Ladhams, Godalming, for mixed group of shrubs and herbaceous plants.

FRUIT AND VEGETABLE COMMITTEE (AT CHELSEA).—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twenty-two other members present.

There was no business before the Committee on this occasion.

FLORAL COMMITTEE A (AT CHELSEA).—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended :—

Award of Merit.

To Begonia 'A. R. Flint' as a greenhouse flowering plant (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 318.

To Begonia 'Everest' as a greenhouse flowering plant (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 318.

To Begonia 'Lady Lilford' as a greenhouse flowering plant (votes 17 for, 2 against), from Messrs. Blackmore & Langdon, Bath. See p. 318.

Selected for trial at Wisley.

Dianthus 'Delight' from Messrs. Allwood, Haywards Heath.

Schizanthus 'Pansy Flowered, Danbury Park Strain,' from Mrs. J. T. Wigan, Chelmsford.

Other Exhibits.

Messrs. Allwood, Haywards Heath: Dianthus Sweet Wivelsfield 'Rose,' Dianthus 'Pinkie.'

Messrs. Engelmann, Saffron Walden: *Gerbera Jamesonii hybrida fl. pl.*

Messrs. Gibson, Leeming Bar: Trollius 'Mrs. George Gibson.'

Mr. A. Johnson, East Grinstead: Myosotis 'Mrs. K. Johnson.'

Messrs. Kelway, Langport: Pyrethrum 'Kelway's Rosy Splendour.'

Mr. W. H. Lambert, Stourbridge: Polyantha Roses.

Mr. E. B. Le Grice, North Walsham: Roses 'Crimson Beauty,' 'Brilliancy' and 'Van Nes.'

Mr. H. G. Longford, Abingdon: Dianthus 'Duchess of Kent.'

Messrs. S. Low, Enfield: Rose 'Conchita.'

Messrs. Watkins & Simpson, London: *Calceolaria angustifolia* hybrids and *Calceolaria Hieronymi* hybrid.

FLORAL COMMITTEE B (AT CHELSEA).—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-five other members present.

Awards Recommended :—

Award of Merit.

To *Acer monspessulanum*, red-fruited form, as a hardy, ornamental-fruiting shrub (votes 20 for), from Douglas Clarke, Esq., Cranbrook. See p. 318.

To *Anemone obtusiloba patula* as a hardy flowering plant (votes unanimous), from the Donard Nursery Co., Newcastle, Co. Down. See p. 318.

To *Berberis montana* as a hardy flowering shrub (votes unanimous), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. See p. 318.

To *Campanula tridentata* as a flowering plant for the rock garden and alpine house (votes 20 for), from G. P. Baker, Esq., Sevenoaks. See p. 318.

To *Daphne × Burkwoodii* as a hardy flowering shrub (votes 17 for), from Albert Burkwood, Esq., Poole. See p. 319.

To *Echium Bourgaeum* as a half-hardy biennial flowering plant (votes 13 for, 3 against), from Viscountess Byng of Vimy, Thorpe-le-Soken. See p. 319.

To *Enkianthus chinensis* as a hardy flowering shrub (votes unanimous), from G. H. Johnstone, Esq., Trewithen, Cornwall. See p. 320.

To *Isotrydaea × Violetta* (*Isoloma bogotense × Tydaea 'Sultan'*) as a flowering plant for the warm greenhouse (votes 20 for), from Major William Van de Weyer, Dorchester. See p. 320.

To *Olearia floribunda* as a hardy flowering shrub (votes 14 for, 3 against), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. See p. 320.

To *Paeonia 'Crimson Globe'* as a hardy flowering plant (votes 10 for, 1 against), from Messrs. Pritchard, Christchurch. See p. 320.

To *Paeonia emodi* as a hardy flowering plant (votes unanimous), from Major F. C. Stern, Goring-by-Sea. See p. 321.

To *Paeonia Moutan 'Silver Pink'* as a hardy flowering shrub (votes 16 for), from Major F. C. Stern, Goring-by-Sea. See p. 321.

To *Paeonia 'Redwood'* as a hardy flowering plant (votes unanimous), from Major F. C. Stern, Goring-by-Sea. See p. 321.

To *Ranunculus × Arendsii* as a hardy flowering plant (votes 20 for), from Messrs. Elliott, Stevenage. See p. 321.

To *Staphylea Coulombieri grandiflora* as a hardy flowering shrub (votes 19 for), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross.

To *Syringa* 'Maréchal Foch' as a hardy flowering shrub (votes unanimous), from Major F. C. Stern, Goring-by-Sea. See p. 326.

To *Vaccinium Mortinia* as a hardy flowering shrub (votes 18 for, 4 against), from Lord Aberconway, Bodnant. See p. 326.

Cultural Commendation.

To Messrs. Ingwersen, East Grinstead, for a specimen plant of *Campanula Celsii*.

Other Exhibits.

Lord Aberconway, Bodnant : *Lomatia obliqua*.

Mrs. G. Anley, Woking : *Veronica* sp.

R. Aireton, Esq., Poole : *Olearia albida*.

F. R. S. Balfour, Esq., Stobo : *Smilacina sessilifolia*.

Miss C. Beck, Ware : *Fritillaria kamschatcensis*.

Dr. Roger Bevan, Henley-on-Thames : *Androsace coccinea*.

Mr. H. S. Boothman, Maidenhead : *Viola heterophylla*.

Brookside Nurseries, Oxford : *Dianthus* 'Jubilee.'

Mrs. Bucknall, Doneraile : *Reseda alba*.

Donard Nursery Co., Newcastle, Co. Down : *Pernettya* 'Bell's Climax.'

Col. Elwes, D.S.O., Cheltenham : *Fuchsia procumbens*.

Mr. T. M. Endean, Laindon : *Mammillaria spinosissima*.

Countess Grey, Howick : *Primula muliensis*.

Lt.-Col. C. H. Grey, D.S.O., Cranbrook : *Fritillaria kamschatcensis*.

Messrs. Hunt, Houndsditch, London : *Myosotis alpestris* var.

Collingwood Ingram, Esq., Benenden : *Prunus prostrata*.

G. H. Johnstone, Esq., Trewithen : *Piptanthus* sp. F. 28392.

Mr. T. A. Lawrenson, Newcastle-on-Tyne : *Saxifraga muscosa aurea*.

Mrs. R. Lukin, Burghfield Common : *Anthyllis cytisoides*, *Iberis ciliata* var. *vifana*, *Rupicapnos africana* var. *mauritanica*.

Mr. W. J. Marchant, Staplehill : *Pernettya leucocarpa* var. *linearis*.

N. W. Marshall, Esq., Pulborough : *Richardia Pentlandii*.

Lady Martineau, Ascot : *Linaria tristis*, *Primula Sieboldii* alba.

Lt.-Col. L. C. R. Messel, O.B.E., Handcross : *Melaleuca squamea*.

Mrs. Christie-Miller, Salisbury : *Primula* 'Sarah Crawley.'

The Hon. Mrs. Sebag-Montefiore, Plymouth : *Abelia spathulata*.

Mrs. R. L. Newman, Plymouth : *Allium Schubertii*.

Messrs. Prichard, Christchurch : *Paeonia* 'Pearl of May,' *P. aristata* *salmonea*.

Lord and Lady Rockley, Poole : *Prostranthera coccinea*.

Mr. John Scott, Merriott : *Cupressus macrocarpa argentea*.

Viscountess St. Cyres, Lymington : *Grevillea longifolia*, *Ochna multiflora*.

Major F. C. Stern, Goring-by-Sea : *Aristolelia racemosa*, *Syringa* 'Kathleen Havemeyer,' S. 'Mrs. Edward Harding.'

Messrs. Watkins & Simpson, Drury Lane, London : *Nierembergia hippomanica*.

P. D. Williams, Esq., St. Keverne : *Ribes longiracemosa*.

Dr. G. C. Williamson, Guildford : *Crocidium multicaule*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and twenty other members present.

Awards Recommended :—

First-class Certificate.

To *Cymbidium* × 'Balkis' (*Alexanderi* × 'Rosanna') (votes 15 for, 2 against), from Lionel de Rothschild, Esq., Exbury. See p. 319.

To *Vuylistearea* × 'Rosalie' var. 'Madge Le Gros' (*Odontonia* × 'Duchess of York' × *Odontioda* × 'Laura') (votes 11 for, 4 against), from N. Prinsep, Esq., Pevensey Bay, Sussex.

To *Odontoglossum crispum* var. 'Reliance' (votes 13 for, 4 against), from Messrs. Charlesworth, Haywards Heath. See p. 320.

To *Cymbidium* × 'Cremona' var. 'Black Prince' ('Cygnets' × *Cooperi*) (votes 13 for, 6 against), from Messrs. McBean, Cooksbridge. See p. 319.

Award of Merit.

To *Vanda suavis alba* (votes unanimous), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey.

To *Dendrobium moschatum*, Gatton Park var. (votes unanimous), from Sir Jeremiah Colman, Bt. See p. 319.

To *Cymbidium* × 'Swallow,' Exbury var. (*Alexanderi* × *Pauwelsii*) (votes 17 for, 1 against), from Lionel de Rothschild, Esq. See p. 319.

To *Ansellia nilotica* var. *splendens* (votes 10 for, 5 against), from M. L. Wells, Esq., Chiddingfold, Surrey. See p. 318.

To *Odontoglossum* × 'Mecutans' var. *Perfectum* ('crispus-Solon' × 'Rosina') (votes 18 for, 1 against), from N. Prinsep, Esq. See p. 320.

To *Cymbidium* × 'Dora' var. 'Golden Empress' ('Wheat ear' × 'Bullfinch') (votes 15 for), from Messrs. H. G. Alexander, Tetbury. See p. 319.

To *Cymbidium* × 'Olympus' var. 'Monarch' (*Alexanderi* × 'Vesta') (votes 16 for, 4 against), from Messrs. H. G. Alexander, Tetbury. See p. 319.

To *Odontonia* × 'Theodora' (*Odontonia* × 'Nestor' × *Odontoglossum* × 'Purple Queen') (votes 12 for, 5 against), from Messrs. Charlesworth. See p. 320.

To *Cymbidium* × 'Profusion' var. *violaceum* ('Vesta' × 'Ceres') (votes 11 for, 3 against), from Messrs. McBean. See p. 319.

Cultural Commendation.

To Messrs. Sanders, St. Albans, for a well-leaved plant of *Angracum sesquipedale*.

To Mr. J. E. Jones, Orchid grower to C. Glidden Osborne, Esq., Marlow-on-Thames, for *Brassocattleya* × 'Tilly' with ten large flowers, and for *Oncidium sphacelatum*, with many-flowered spikes.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and sixteen other members present.

Nine varieties of Tulips were submitted to the Committee, but none was recommended for award.

JOINT RHODODENDRON COMMITTEE (AT CHELSEA).—Mr. E. H. WILDING in the Chair, and eleven other members present.

Awards Recommended :—

First-class Certificate.

To *R. Broughtonii aureum* (votes unanimous), from Dame Alice Godman, South Lodge, Horsham. See p. 322.

To *R. fictolacteam*, Ward's var. (K.W. 4509) (votes 9 for), from J. J. Crosfield, Esq., Embley Park, Romsey, Hants. See p. 324.

Award of Merit.

To *R.* 'Caroline Whitner' (votes 9 for), from Lady Loder, Leonardslee, Horsham. See p. 322.

To *R. siderophyllioides* Hutch. sp. nov. (votes unanimous), from J. J. Crosfield, Esq., Embley Park, Hants. See p. 326.

To *R.* 'Fire Glow' (votes unanimous), from J. J. Crosfield, Esq., Embley Park, Hants. See p. 324.

To *R.* 'Bow Bells' (votes 6 for, 2 against), from Lionel de Rothschild, Esq., Exbury, Hants. See p. 322.

Recommended for trial at Exbury.

R. (Azalea) 'Pink Perfection' (votes unanimous), and

R. (Azalea) 'Jubilee' (votes unanimous),

both from Messrs. Waterer, Sons & Crisp, Bagshot.

R. 'Dr. A. Blok' (votes 6 for), from The Walton Park Nurseries, Walton-on-Thames, Surrey.

Other Exhibits.

Col. Bolitho, Heamoor, Penzance: *R. dendricola*.

G. P. Baker, Esq., Sevenoaks: *R. radicans*.

P. D. Williams, Esq., Lanarth, Cornwall: *R.* 'Chinese Pink,' *R.* 'St. Anthony,' *R.* 'Garnet,' and *R. (Azalea)* 'Picador.'

Messrs. Waterer, Sons & Crisp, Bagshot, Surrey: *R. (Azalea)* 'Bagshot Flame.'

The Walton Park Nurseries, Walton: *R.* 'G. Streseman' and *R.* 'Dr. Arnold W. Endtz.'

O. W. Blackmore, Esq., Leytonstone, E. 11: *R. (Azalea)* hybrid unnamed.

J. J. Crosfield, Esq., Embley Park, Romsey, Hants: *R.* 'Embley Park,' *R.* 'Silver Pink,' *R.* 'Fairy Bell,' *R.* 'Strawberry,' *R.* 'Sun Glow,' *R.* 'Glow,' and *R. triflorum*.

Lionel de Rothschild, Esq., Exbury, Hants: *R.* 'Caliban.'

JOINT IRIS COMMITTEE (AT CHELSEA).—Major F. C. STERN, O.B.E., in the Chair, and eleven other members present.

Selected for Trial at Wisley.

Iris 'Malta,' shown by G. L. Pilkington, Esq., Lower Lee, Woolton, nr. Liverpool.

Iris 'Golden West,' shown by F. Wynn Hellings, Esq., Fleur-de-Lis, Grove Way, Esher.

Other Exhibits.

G. L. Pilkington, Esq.: Irises 'Mrs. Alex. Wilson,' 'Polar King,'

F. Wynn Hellings, Esq.: Iris 'Gentius.'

F. W. Tomalin, Esq., Gloucester Road, Hampton, Middx.: Iris 'Monowai.'

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

Fellows are reminded that these Notices form the vehicle by which the Society conveys to them information regarding any alterations or additions in the Society's activities. Although undoubtedly the value of these Notices is appreciated by many, there are still other Fellows of the Society who do not appear to have discovered their usefulness. It would be of great assistance if those Fellows who have found these notes of value to them would bring them to the notice of their friends.

In the case of the change of venue of the Sweet Pea Society's Show from our Hall to the Alexandra Park, Hastings, in spite of the fact that this change was commented upon three times in the JOURNAL (in the May, June and July issues), yet a great number of Fellows were disappointed through seeing no mention of it, and coming up to London to visit the Show.

SUBSCRIPTIONS.

Fellows are reminded that their friends joining the Society after July 1 and before October 1 will be required to pay only a half-year's subscription, and will receive the monthly JOURNAL, commencing with the July number. Those joining after October 1 and before January 1 pay a full year's subscription, which entitles them to all the privileges of Fellowship until January 1, 1937. Back numbers of the JOURNAL are always obtainable at 9d. a number.

INTERNATIONAL CONFERENCES.

During the autumn of this year two International Conferences are to take place. The first, the International Botanical Congress at Amsterdam, on September 2-7, when the Society will be represented by Mr. F. J. CHITTENDEN; the second, the International Horticultural Congress at Rome, on September 16-21, when the Society will be represented by Dr. RENDLE, Mr. G. W. LEAK, and Mr. F. J. CHITTENDEN. One of the important subjects to be discussed is that of plant nomenclature, and the Council has set up a special committee to prepare lists with the object of stabilizing the nomenclature of horticultural plants.

CALENDAR.

August 8.—Closing date for entries for the Great Autumn Show to be held at the National Hall, Olympia.

August 13, 1-6 P.M.—Fortnightly Meeting. Gladioli may be expected to be seen at their best, and there will be a competition for the Foremarke Cup. This cup is offered for twenty spikes of named Gladioli in not less than ten varieties, and not more than two spikes of any one variety. The competition is open to

cxviii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

both trade and amateur growers, and entries must be received not later than by the first post on Wednesday, August 7.

At 3.30 on Tuesday afternoon, August 13, in the Lecture Room of the New Hall, the Hon. Mrs. RYDER will speak on "The Flowers of the Karroo." The lecture will be illustrated by lantern slides.

August 13, 1-7.30 P.M., and August 14, 10 A.M. to 5 P.M.—British Gladiolus Society's Show to be held in the Old Hall.

August 27, 1-6 P.M.—Fortnightly Meeting. Dahlias will now be coming into prominence, and there will also be the first autumn Roses and late Gladioli.

For the encouragement of the cultivation of autumn-flowering plants for the rock garden, there will be a competition for the Sewell Medal for Alpines, and on this occasion it will be confined to amateur exhibits. The conditions governing the competition will be found on p. 30 of the January number of the JOURNAL.

At 3.30 on the afternoon of August 27, in the Lecture Room of the New Hall, Mr. B. WELLS will speak on "New Herbaceous Plants."

August 30, 2.30-8 P.M., and August 31, 10 A.M. to 6 P.M.—London Allotments and Gardens Show Society's Exhibition.

August 30 and 31.—The Honorary Secretary of the Southgate and District Horticultural Society has asked that notice might be given to the effect that any Fellow of the Royal Horticultural Society wishing to visit their Show will be admitted free on showing his R.H.S. ticket. For particulars please apply to the Hon. Secretary, Southgate and District Horticultural Society, Town Hall, Palmer's Green, N. 13.

September 3, 1-7.30 P.M., and September 4, 10 A.M. to 5 P.M.—National Dahlia Society's Show.

September 6, 2.30-9 P.M., and September 7, 2.30-6.30 P.M.—London Gardens Society Exhibition of Flowers.

September 10, 1-6 P.M.—Fortnightly Meeting. Dahlias and early Chrysanthemums will be the chief flowers at this Show.

At 3.30 on Tuesday afternoon, September 10, in the Lecture Room of the New Hall, Dr. FRED STOKER, F.L.S., will speak on "The Cultivation of Ericaceous Plants."

September 13, 12 noon to 7 P.M., and September 14, 11 A.M. to 5 P.M.—National Rose Society's Show. This Show will be on a large scale, as it takes the place of the usual Rose Show at Chelsea, which, unfortunately, had to be postponed on account of the climatic conditions during the month of May. At this Show there will be special competitive classes, and Fellows and Associates of this Society will be admitted free of charge on presentation of their membership tickets.

September 25, 26 and 27.—Autumn Show, National Hall, Olympia. (See special paragraph.)

ADDITIONAL SHOW.

Alpine Garden Society.

Fellows are asked to note that there will be a Show arranged by the Alpine Garden Society on Tuesday, September 10, in the Old Hall, from 1-6 P.M. This Show has been arranged since the Calendar was printed. Fellows' tickets will admit.

CONFERENCE ON CHERRIES AND SOFT FRUIT.

The Cherry and Soft Fruit Conference was held on July 16 and 17. It was well attended, and some very interesting papers on the cultivation of soft fruits were discussed. These papers will shortly be published in a volume dealing specially with these fruits, and any Fellow who is interested in this volume is asked to notify the Secretary.

AUTUMN SHOW.

The Autumn Show is the second largest Show arranged by the Society, and as the Chelsea Show is important for the commencement of the year, bringing together all the spring flowers, so the Autumn Show is of similar importance in gathering together all the autumn flowers and beautiful shrubs in autumn colouring. The Autumn Show forms a meeting-place for all Fellows who are anxious to restock their gardens during the coming planting season.

Particulars of the hours of admission to the Show are given below, and Fellows can also find them on their Fellowship tickets.

September 25, 11 A.M. to 9.30 P.M.

" 26, 10 " " 9.30 "

" 27, 10 " " 5.0 "

The prices of admission for non-Fellows are :

September 25.—11 A.M. to 2 P.M.	10/-
2 P.M. „ 6 „	5/-
6 „ „ 9.30 P.M.	2/6
„ 26.—10 A.M. „ 6 P.M.	2/6
6 P.M. „ 9.30 P.M.	1/-
„ 27.—10 A.M. „ 5 P.M.	1/-

The two Challenge Cups for competition at the Autumn Show are the Coronation Cup, which was founded in 1911, and is offered for the best exhibit at the Show, and the Wigan Cup, presented to the Society by Mr. A. L. Wigan in 1911, and offered for the best exhibit of Roses staged. Applications for schedules should be made to the Secretary.

HALL LETTINGS.

On September 3 and 4 the British Bee Keepers' Association are holding their Annual Exhibition in the Old Hall, when there will be competitive classes for Honey, and demonstrations. Fellows desiring any further information with regard to this Exhibition are asked to apply to the Secretary, Mr. J. HERROD-HEMPSALL, 23 Bedford Street, London, W.C. 2.

From September 19-28 the Old Hall has been let for a Model Engineering Exhibition, which is very popular with schoolboys and their parents. Any further particulars may be obtained from Messrs. PERCIVAL MARSHALL & CO., LTD., 13-16 Fisher Street, W.C. 1.

The New Hall has been let from September 23-27 for the Chemists' Exhibition, and from October 21-25 for the Medical Exhibition. Particulars may be had from the British and Colonial Druggist, Ltd., 194-200 Bishopsgate, E.C. 2.

The New Hall has been taken by the National Federation of Women's Institutes from November 13-20, when they are to stage a large collective exhibition of the work of the Institutes. Particulars are obtainable from the National Federation of Women's Institutes, 39 Eccleston Street, S.W. 1.

EXAMINATIONS.

National Diploma in Horticulture.

The Practical and viva voce Examinations for the National Diploma in Horticulture and the Advanced Examination for Teachers were held at the Wisley Gardens during June, and the results have now been published.

In the National Diploma in Horticulture sixty-nine Preliminary candidates attended at Wisley for the practical tests, and the Examiners recommended that twenty-six of these should pass. These candidates do not receive a diploma until they have passed the Final Examination, for which they are eligible on completion of six years' practical gardening. The standard for the Final N.D.H. Examination is a high one, and in Section 1 (General Horticulture) this year only seven of the thirty candidates who presented themselves at Wisley reached the standard required. The Society's Diploma is awarded to these candidates, whose names are as follows :

Mr. ANDREW H. WHYTE, "Oakdene," Meole Brace, Shrewsbury.
 Mr. DEREK V. INGRAM, 10 Arthur Avenue, Lenton, Nottingham.
 Mr. HUBERT TAYLOR, The University, Reading
 Mr. ALBERT V. PIKE, "Nomocharis," Forest Green, near Maidenhead.
 Mr. JOSEPH FOWLES, R.H.S. Gardens, Wisley, Ripley, Surrey.
 Mr. ROBERT DUNCAN, Department of Agriculture, The University, Leeds.
 Mr. FREDERICK W. SHEPHERD, R.H.S. Gardens, Wisley, Ripley, Surrey.

The Diploma is also awarded to the following two candidates, who took Section 6 (Gardening in Public Parks) :

Mr. DONALD HARVEY, 206 Turncroft Lane, Stockport, Cheshire.
 Mr. JOHN R. B. EVISON, c/o The Parks Department, Brighton.
 And to the candidate who sat for Section 7 (Horticultural Inspection) :
 Miss RACHAEL CROSS, Crofton Pound, Orpington.

Teachers' Advanced Examination.

Twenty-two Advanced candidates attended at Wisley in June for the Practical and viva voce Examinations, and twelve of these satisfied the Examiners and are awarded the Society's Certificate.

SPECIAL NOTICE.

In view of the numerous inquiries that are still being made at Vincent Square, it appears desirable to repeat the following paragraph which we have published in previous numbers of the JOURNAL under Notices to Fellows :

" In view of inquiries received and in order to avoid any misunderstanding on the part of the Fellows of the Royal Horticultural Society, the Council of the Society wishes it to be known that the appeal which has been made in connexion with Erlestoke Park, Wiltshire, has not been in any way made with the support or under the auspices of the Society."

INSPECTION OF GARDENS.

Many Fellows may not be aware of the terms under which their gardens can be inspected by the Society's Garden Inspector, and advice given. They are set out below, and it will be seen that special arrangements can be made when Fellows living in the same district co-operate.

" The inspection of Gardens belonging to Fellows is conducted by a thoroughly competent Inspector from the Society, who reports and advises at the following cost, viz. : a fee of £3 3s. for one day (or £5 5s. for two consecutive days), together with all out-of-pocket expenses. No inspection may occupy more than two days, save by special arrangement. Should two or more Fellows residing in the same district, with their Gardens within easy reach of one another, desire to have the services of the Garden Inspector, arrangements will be made for such a combined inspection and the fee and expenses divided by consent of those concerned. Fellows wishing for the services of an Inspector are requested to give at least a week's notice and choice of two or three days, and to indicate the most convenient railway station and its distance from their Garden. Gardens can only be inspected at the *written* request of the owner."

WISLEY IN AUGUST.

The Herbaceous Border will still form one of the most attractive portions of the Garden during this month, and though many plants may be past their best, others of a later flowering habit will make a visit to this part of the Garden worth while.

Among the Trials the following may be expected to give a good display :

The large number of varieties of Petunia, which include more than two hundred entries in various shades of colour, ranging from white to red-purple, the flowers being from 2 to 5 inches in diameter ; in habit much variation will be found, some developing into a compact dwarf plant while others attain a height up to 2 feet.

A large number of Verbenas growing near the Petunias will also be at their best and deserve a visit, as among the varieties constituting the Trial many beautiful coloured hybrids may be seen.

About three hundred Gladiolus varieties growing near the Herbaceous Border will now be in bloom. These received a considerable check from the frosts of May which may affect their strength in flowering, but the combination of colour of the various varieties and sections may be expected to produce an attractive result.

Of the shrubs in flower during August *Eucryphia pinnatifolia*, *Cyrilla racemiflora*, and Roses, of both species and hybrids, as well as other shrubs of a late flowering character, will be flowering in the Wild Garden and elsewhere.

At this late season the Rock Garden cannot be expected to maintain the interest in flowering plants of the spring and early summer, but such genera as *Cyananthus*, *Campanula*, *Gentiana*, and others, will maintain the interest of those to whom alpine plants appeal.

The Greenhouses and Half Hardy Plant house will also contain plants of interest. In the former a good collection of Pelargonium and various flowering shrubs, and climbing plants, will be seen, while the half-hardy house contains many representatives of the flora of South Africa, Australia, and the milder portions of Western America.

GENERAL MEETINGS.

JUNE 4, 1935.

A lecture was given by Messrs. R. C. NOTCUTT, F.L.S., and R. F. NOTCUTT, B.A., on "Japanese Cherries for English Gardens" (p. 354).
Chairman, Dr. WILFRID FOX.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and five other members present.

Claytonia parvifolia.—Mr. Hales showed examples of this deep pink-flowered plant, a native of western N. America and good for both sunny and shady situations.

Laburnum inflorescence fasciated.—Mr. J. Grimes of Penarth sent a branch of a seedling *Laburnum* (of the *L. × Vossii* type) in which several of the racemes were fasciated and tasselled at the tip, sometimes two, sometimes as many as five free tips 2 or 3 inches in length being present.

Twitch penetrating bulb.—Mr. Hind of Croydon sent a *Narcissus* bulb which had been pierced by the stolon of twitch, so that the bulb had been split through the middle while intact above and below.

Blandfordia marginata, a Tasmanian plant, exhibited by Lord Aberconway and Lt.-Col. L. C. R. Messel, was referred to this Committee from Floral Committee B. The Committee unanimously recommended a Botanical Certificate to this plant, which shows some remarkable botanical characters in the floral structure.

Sectorial chimera in Papaver nudicaule.—A flower of *Papaver nudicaule* partly yellow, partly orange, was sent by Mr. F. C. Stern, exhibiting the well-known phenomenon of somatic segregation.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and seven other members present.

Exhibits.

R.H.S. Gardens, Wisley: samples of Asparagus, 'Connover's Colossal,' 'Harwood's Giant,' 'Glory of Brunswick,' 'Snowhead.'

Mr. E. A. Bunyard, Allington: Apple 'Cox's Orange Pippin.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended:—*Gold Medal.*

To Messrs. Bolton, Halstead, for Sweet Peas.

Silver Flora Medal.

To Messrs. Barr, London, for Tulips, Irises, Lupins, etc.

To Messrs. Dobbie, Edinburgh, for Dahlias.

To Messrs. Dobbie, Edinburgh, for Tulips.

To Mr. E. Ladhams, Elstead, for herbaceous and aquatic plants.

Silver Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Lupins, Delphiniums and other herbaceous plants.

To Mr. G. R. Downer, Chichester, for Lupins.

To Messrs. Engelmann, Saffron Walden, for Carnations, Pansies, etc.

To Messrs. Kelway, Langport, for Pæonies.

To Messrs. S. Low, Enfield, for Carnations and other greenhouse plants.

To Messrs. Prichard, Christchurch, for Lupins and other herbaceous plants.

To Suffolk Seed Stores, Woodbridge, for herbaceous plants.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations and Dianthus 'Sweet Wivelsfield.'

To Mr. J. Douglas, Great Bookham, for Auriculas and Border Carnations.

To Messrs. Wakeley, London, for Tulips.

Banksian Medal.

To Messrs. Daniels, Norwich, for *Chrysanthemum maximum* 'Esther Read.'

To Messrs. Sutton, Reading, for Antirrhinums.

Selected for trial at Wisley.

- Dianthus* 'Saltdean Gem,' from F. I. Lansdell, Esq., Saltdean.
Lupinus arboreus 'Sweet Lavender,' from Messrs. Hurst, London.
Lupinus polyphyllus 'Mrs. Sydney Pearson,' from Messrs. Redgrove & Patrick, Sevenoaks.
Lupinus polyphyllus 'Richmond,' from T. Hay, Esq., M.V.O., Hyde Park, London.
Paeonia 'Defender,' from Major F. C. Stern, O.B.E., Goring-by-Sea.
Schizanthus 'Dwarf Pink,' from Messrs. Hurst, London.

Other Exhibits.

- Ardwell Nurseries, Beaconsfield: *Tritonia* 'Ardwell Gem.'
 Mrs. G. F. Weld Blundell, Liverpool: *Hydrangea hortensis* 'Frederica.'
 H. Coxeter, Esq., Peaslake: *Myosotis* 'Nesta.'
 Messrs. Fogwill, Guildford: *Papaver nudicaule* 'Guildford Strain.'
 Mr. W. M. Gould, South Walsham: *Chrysanthemum maximum* var.
 W. Hargrave, Esq., Pulborough: *Pelargonium* 'Brinsbury Gem' and *Pelargonium* 'Tagada.'
 F. Wynn Hellings, Esq., Esher: Irises.
 Lady Hudson, Roehampton: Iris 'Golden Hind.'
 Messrs. Prichard, Christchurch: *Campanula persicifolia* 'Princess Royal.'
 Mr. T. Robinson, Nottingham: Alpine Rose 'Peon.'
 Messrs. Russell, Richmond: greenhouse plants.
 Messrs. Spencer, Hockley: Dahlias.
 S. P. Wells, Esq., Bournemouth: *Dianthus* 'S. P. Wells.'
 Messrs. Wheatcroft, Nottingham: Roses.
 D. Landale Wilson, Esq., Windlesham: *Dianthus* 'Mrs. F. Glass.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver Banksian Medal.

- To Mr. W. A. Constable, Southborough, for Lilies.
 To Messrs. Neale, Newhaven, for *Gazania*, *Mesembryanthemums* and Cacti.
 To Messrs. Waterer, Sons & Crisp, Bagshot, for *Rhododendrons* and other flowering shrubs.

Flora Medal.

- To Messrs. Cheal, Crawley, for flowering shrubs.

Banksian Medal.

- To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for flowering shrubs.
 To Letchworth Plants, Ltd., Letchworth, for alpine plants.
 To Messrs. Prichard, Christchurch, for alpine plants.
 To Messrs. Rogers, Southampton, for alpine plants.
 To Messrs. Russell, Richmond, for alpine plants.
 To Messrs. Waterer, Sons & Crisp, Bagshot, for alpine plants.
 To Mr. W. Wells, jun., Merstham, for *Lewisia*.

Preliminary Commendation.

- To *Meconopsis grandis* × *M. betonicifolia* (votes unanimous), from W. G. Sheldon, Esq., Oxted.
 To *Veronica* sp. (votes unanimous), from Dame Alice Godman, D.B.E., Horsham.

Other Exhibits.

- Lord Aberconway, Bodnant: *Blandfordia marginata*, *Roettlera Forrestii*.
 Mrs. G. Anley, Woking: *Veronica Astonii*, *V. monticola*.
 G. P. Baker, Esq., Sevenoaks: *Paeonia* sp., *Viola saxatilis* var. *aetolica*.
 The Dowager Countess Cawdor, Haslemere: *Vaccinium corymbosum*.
 H. C. Crook, Esq., Bromley: *Campanula orphanidea*.
 Messrs. Engelmann, Saffron Walden: *Sempervivums*.
 Dame Alice Godman, D.B.E., Horsham: *Cantua dependens*.
 R. Hayne, Esq., Weymouth: *Cestrum Newellii*, *Pittosporum Ralpii*, *Corokia macrocarpa*.
 Miss Hopkins, Coulsdon: rock plants.
 Messrs. Hurst, London, E.C.: *Myosotis Welwitschii*.
 Lord Ilchester, Abbotsbury: *Euonymus Wilsonii*.
 Collingwood Ingram, Esq., Benenden: *Genista Jahandiezii*, *Iris Xiphium lusitanica*, *Gladiolus hybrids*.
 The John Innes Hort. Inst., Merton: *Calceolaria Fothergillii*.
 Mrs. Philip Leese, Ludlow: seedlings of *Lilium regale*.

Lt.-Col. L. C. R. Messel, O.B.E., Handcross : *Blandfordia marginata*.

Mrs. Milford, Chedworth : alpine plants.

Messrs. Prichard, Christchurch : *Campanula* sp., *Paeonia Delavayi* var. *acutiloba*.

Mr. J. Robinson, Eltham : alpine plants.

Lady Rockley, Poole : *Euryclis Cunninghamii*.

Paul Rosenheim, Esq., Molesey : *Didissandra lanuginosa*.

G. S. Sansom, Esq., Milford : *Hippeastrum reticulatum*.

Major F. C. Stern, O.B.E., Goring-by-Sea : *Prunus Padus*.

Mr. W. Wells, jun., Merstham : *Viola saxatilis* var. *aetolica*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and eleven other members present.

Award Recommended :—

Award of Merit.

To *Miltonia* × 'Petunia,' Eddington House var. (*Bleuana* × 'Princess Mary') (votes unanimous), from T. Harrison Hughes, Esq., Hungerford, Berks. See p. 371.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group.

Messrs. Black & Flory, Slough : a group.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

Messrs. Stuart Low, Jarvis Brook : a group.

Messrs. Sanders, St. Albans : a group.

Messrs. H. G. Alexander, Tetbury : a group.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and ten other members present.

Awards Recommended :—

First-class Certificate.

To *Rhododendron* × 'Albatross,' Exbury var. (votes unanimous), from Lionel de Rothschild, Esq., Exbury. See p. 372.

Award of Merit.

To *R.* × 'Cinnkeys' (votes unanimous), from E. J. P. Magor, Esq., Lamellen, St. Tudy, Cornwall. See p. 372.

Other Exhibits.

Lord Aberconway, Bodnant, N. Wales : *R.* 'Dante,' *R.* 'Radiance,' *R.* 'Venus.'

C. E. Heath, Esq., Anstie Grange, Holmwood, Surrey : *R.* 'Mrs. Cuthbert Heath.'

C. Ingram, Esq., Benenden, Kent : *R. astrocalyx*.

Lt.-Col. L. C. R. Messel, O.B.E., Nymans, Handcross, Sussex : *R. polyanthum* (K.W. 6276).

Messrs. Waterer, Sons & Crisp, Bagshot, Surrey : *R.* 'Albatross cross.'

JUNE 6, 1935.

JOINT IRIS COMMITTEE (IRIS SOCIETY'S SHOW).—Major F. C. STERN, O.B.E., in the Chair, and fourteen other members present.

Selected for trial at Wisley.

Irises 'Chancellor,' 'Brown Seedling' and 'Yellow Seedling,' shown by Major F. C. Stern, O.B.E., Highdown, Goring-by-Sea.

Other Exhibits.

Major F. C. Stern, O.B.E. : Iris 'Dorabella.'

E. C. Goulton, Esq., Beechville Lane, Swanley, Kent : Irises 'Pale Blue Seedling' and 'Grace.'

T. W. Tomalin, Esq., Gloucester Road, Hampton : Irises 'Seedling plicata' and 'Mrs. T. W. Tomalin.'

JUNE 18, 1935.

SEWELL MEDAL COMPETITIONS.

The *Sewell Medal*, for the best exhibit of six pots or pans of plants suitable for the rock garden or alpine house.

Amateur Grower.

To Mark Fenwick, Esq., Abbotswood, Stow-on-the-Wold, Glos.

CXXIV PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Trade Grower.

To Messrs. Clarence Elliott, Ltd., Stevenage.

A lecture was given by Mr. C. T. MUSGRAVE on "Gentians."

Chairman, Mr. T. HAY, M.V.O., V.M.H.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

Raspberry with sepaloid petals.—Mr. W. B. Crane showed Raspberry flowers in which the petals were virescent and remarked that in one family of seedlings 80 per cent. had proved to be of this form.

Gall on Salix Caprea.—A very much enlarged catkin of *S. Caprea* was shown from Ealing, hypertrophied by the attack of a mite, probably *Eriophes triradiatus*. The species usually attacked is *Salix fragilis*, and this is the first attack on *S. Caprea* seen by the Committee.

Mushroom aberrant.—Mr. Balfour, of Slough, sent a mushroom which had produced two or three other mushrooms on the top of the pileus of the original one, springing from a swelling thereon.

Crinum species.—Major Pam sent an inflorescence of a *Crinum* of unknown origin from his garden. Mr. Worsley considered it a new species related to *C. giganteum*. It has a very large bulb and produces a thick tall stem, bearing many flowers with large green bracts at the base of the inflorescence.

Hypoxis sp.—Colonel Grey sent a yellow-flowered *Hypoxis*, now producing flowers and young leaves from a large corm which had lain dormant for over a year from its introduction from South Africa. The Committee considered it to be probably *Hypoxis Rooperi*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Awards Recommended :—

Silver Hogg Medal.

To Messrs. T. Rivers, Sawbridgeworth, for Cherries in pots.

Other Exhibits.

Duke of Richmond and Gordon (gardener, Mr. S. Capon), Goodwood : Melon 'Goodwood.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Kelway, Langport, for Pæonies.

Silver Flora Medal.

To Messrs. Bath, Wisbech, for Pæonies and Lupins.

To Messrs. Blackmore & Langdon, Bath, for Begonias and Delphiniums.

To Messrs. W. H. Simpson, Birmingham, for Lupins.

Silver Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, Zinnias and Pansies.

To The Highfield Nursery Co., Enfield, for Violas.

To Mr. E. Ladhams, Elstead, for herbaceous plants and shrubs.

To Messrs. Prichard, Christchurch, for Lupins and other herbaceous plants.

To Messrs. Prince, Oxford, for Roses.

To Messrs. Simmons, Finchley, for Violas.

To Messrs. Stewart, Wimborne, for Irises and other herbaceous plants and shrubs.

Silver Lindley Medal.

To The John Innes Horticultural Institution, Merton, for Calceolarias.

Flora Medal.

To Messrs. Barr, London, for Irises, Lupins and Pæonies.

To Messrs. Gibson, Leeming Bar, for Poppies and Lupins.

To Messrs. Low, Enfield, for greenhouse plants.

To Messrs. Russell, Richmond, for greenhouse plants.

Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations and *Dianthus Allwoodii*.

To Letchworth Plants, Ltd., Letchworth, for herbaceous plants.

To Rev. Canon Rollo Meyer (gardener, Mr. J. P. Izzard), Watton-at-Stone, for Irises.

To Swanley Horticultural College, Swanley, for greenhouse plants.

To Mr. G. E. P. Wood, Ashted, for Delphiniums and other herbaceous plants.

Award of Merit.

To *Begonia* 'Lucy Dare' as a greenhouse plant (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 371.

To *Begonia* 'Oriole' as a greenhouse plant (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 371.

To *Begonia* 'Violet Jackman' as a greenhouse plant (votes 9 for, 2 against), from Messrs. Blackmore & Langdon, Bath. See p. 371.

To Pæony 'Kelway's Glorious' as a variety for cutting and market (votes unanimous), from Messrs. Kelway, Langport. See p. 371.

To Rose 'Conchita' (votes unanimous), from Messrs. S. Low, Enfield. See p. 373.

Other Exhibits.

Chez Nous Nurseries, Newick : Lupins and Pinks.

Messrs. Easlea, Leigh-on-Sea : Rose 'Easlea's Golden Rambler.'

Messrs. James, Crewe : *Chrysanthemum maximum* 'Silver Jubilee.'

Messrs. Redgrove & Patrick, Sevenoaks : Lupins and other herbaceous plants.

Messrs. Wheatcroft, Nottingham : Roses.

S. H. Whitbread, Esq., Biggleswade : Lupins.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—*Silver Banksian Medal.*

To Hocker Edge Gardens, Cranbrook, for bulbous and alpine plants.

Flora Medal.

To Mr. W. A. Constable, Southborough, for Lilies.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Messrs. Perry, Enfield, for hardy plants.

To Messrs. Prichard, Christchurch, for alpine and herbaceous plants.

Banksian Medal.

To Letchworth Plants, Ltd., Letchworth, for alpine plants.

Award of Merit.

To *Achillea clypeolata* as a hardy flowering plant (votes 12 for, 3 against), from the Director, Royal Botanic Gardens, Kew. See p. 371.

To *Philadelphus Delavayi*, Nymans var., as a hardy flowering shrub (votes 13 for, 4 against), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. See p. 371.

Preliminary Commendation.

To *Asyneuma lobelioides* as a hardy flowering plant (votes unanimous), from Messrs. C. Elliott, Stevenage.

To *Lewisia Richeyi* as a flowering plant for the rock garden and alpine house (votes unanimous), from G. P. Baker, Esq., Sevenoaks.

Selected for trial at Wisley.

Delphinium paniculatum as a hardy annual flowering plant (votes unanimous), from Messrs. Sutton & Sons, Reading.

Other Exhibits.

Messrs. Baker, Codsall : *Syringa Vilmoriniana*?

Messrs. Burkwood & Skipwith, Kingston : *Philadelphus* × *Burkwoodii*.

Chez Nous Nurseries, Newick : *Conandron ramondiioides*.

Mrs. E. R. Cook, Enfield : *Cereus flagelliformis*.

Mr. A. Corderoy, Eltham : rock plants.

Messrs. Elliott, Stevenage : *Campanula betulaeifolia*.

Lt.-Col. C. H. Grey, D.S.O., Cranbrook : *Oreocharis primuloides*, *Hypoxis Rooperi*, *Calochortus amabilis* (F.C.G. 1870).

Miss Hopkins, Coulsdon : rock plants.

C. Ingram, Esq., Benenden : *Gladiolus* hybrid (*G. callistus* × *G. hirsutus*).

Lady Leconfield, Petworth : *Penstemon procerus*.

Lt.-Col. L. C. R. Messel, O.B.E., Handcross : *Leptospermum scoparium* Tasmanian form, *Neillia longiracemosa*, *Salvia* sp. E.K.B. 370a, *Oxothamnus rosmarinifolius* var. *ericifolius*, *Olearia persoonioides*.

Mr. W. O. Nash, King's Lynn : *Cytisus* seedling.

Mrs. R. L. Newman, Dartmouth : *Sophora viciifolia*.

Mr. Amos Perry, Enfield : *Arisaema speciosum*.

Messrs. Rogers, Southampton : rock plants.

F. J. Strover, Esq., South Norwood : *Sprekelia formosissima*.

The Wigmore Fisheries, Ltd., London, W. : aquatic plants.

CXXVI PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and nine other members present.

Award Recommended :—

Cultural Commendation.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a well-flowered plant of *Dendrochilum latifolium*, better known in gardens as *Platyclinis latifolia*.

Other Exhibits.

To Messrs. Armstrong & Brown, Tunbridge Wells : a group.

To Messrs. Charlesworth, Haywards Heath : a group.

To Messrs. Stuart Low, Jarvis Brook : a group.

To Messrs. McBean, Cooksbridge : a group.

Lionel de Rothschild, Esq., Exbury : a well-flowered plant of *Epidendrum aciculare*, which is figured in the Botanical Magazine, t. 4572, under the name *Epidendrum linearifolium*.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron* × 'Angelo' (votes unanimous), from Lionel de Rothschild, Esq., Exbury, Hants.

Other Exhibits.

C. Ingram, Esq., The Grange, Benenden, Kent : *R.* 'Nevada' and *R. hypolepidotum*.

Lionel de Rothschild, Esq. : *R.* 'Caliph,' *R.* 'Romany Chai,' and *R. Elliottii* (K.W. 7725).

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. J. M. BRIDGEFORD in the Chair, and five other members present.

Exhibits.

Mr. W. H. Poole, Percy Road, Hampton : Carnation 'Rosevear.'

Mrs. Henry Tate, Launde Abbey, Leicester : Carnation 'Nairne.'

JOINT DELPHINIUM COMMITTEE.—Mr. G. W. LEAK, V.M.H., in the Chair, and six other members present.

Selected for trial at Wisley.

Delphinium 'Francis,' from W. Holland, Esq., Coke's House, Westburton, Pulborough.

Other Exhibits.

W. Holland, Esq., Westburton, Pulborough : Delphinium 'Cynthia.'

W. J. Hopper, Esq., 84 Sunnymede Road, Kingsbury, N.W. 9 : Delphinium 'Light Blue Triumph.'

JUNE 25, 1935.

AMATEURS' FLOWER SHOW.

Chief Awards.

Silver Cup, to the most successful competitor in Division A.

To Lt.-Col. Stephenson R. Clarke, C.B., Haywards Heath.

Silver Cup, to the most successful competitor in Division B.

To Miss B. M. Perkin, Bognor Regis.

Silver Cup, to the most successful competitor in Division C.

To M. F. Abbott, Esq., Purley.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Selected for trial at Wisley.

Campanula 'Frances,' from J. Holding, Esq., Evesham.

Hemerocallis 'Magnifica,' from G. Yeld, Esq., V.M.H., Gerrards Cross.

Iris Kaempferi lilacina, from the Rt. Hon. Lord Swaythling, Southampton.

Viola (unnamed), from Mrs. J. Fanshawe, Moffat.

Other Exhibits.

Mr. C. Bedbrook, Wallington : Adiantums.

Messrs. James, Crewe : *Chrysanthemum maximum* 'Silver Jubilee.'

Mr. E. W. Platten, Needham Market : *Phyllitis muricatum crispum* var.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver-gilt Lindley Medal.

To Major F. C. Stern, O.B.E., Goring-by-Sea, for a collection of hybrid *Eremuri*.

Award of Merit.

To *Eremurus* 'Citronella' as a hardy flowering plant (votes unanimous), from Major F. C. Stern, O.B.E., Goring-by-Sea. See p. 371.

Cultural Commendation.

To Mr. W. Fleming, gardener to Lt.-Col. Stephenson R. Clarke, C.B., Borde Hill, Haywards Heath, for a specimen plant of *Sarmienta repens*.

Other Exhibits.

Mrs. A. Desborough, Broadstone: *Meconopsis* hybrid (*M. napaulensis* × *M. paniculata*).

W. Balfour Gourlay, Esq., Cambridge: *Lallemantia canescens*.

T. Hay, Esq., Hyde Park: *Geranium* sp. from Kashmir, *Campanula* sp.

Lt.-Col. G. S. F. Napier, Horam: *Senecio Rodriguezii*.

Mrs. Maurice Pope, Chippenham: *Oxyptalum coeruleum*.

The Rt. Hon. Lord Swaythling, Southampton: *Lilium concolor*.

Lord Wakehurst, Wakehurst, Sussex: *Olearia semidentata*, *Leptospermum scoparium Nicholii*.

Mrs. C. M. Whittall, Haslemere: *Prostranthera lasianthos*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and ten other members present.

Awards Recommended :—

Award of Merit.

To *Oncidium Jonesianum*, Eddington House var. (votes unanimous), from T. Harrison Hughes, Esq., Eddington House, Hungerford, Berks. See p. 371.

To *Vanda Parishii*, Capstone var. (votes unanimous), from A. M. Gentle, Esq., The Capstone, St. Albans, Herts. See p. 373.

To *Warscewiczella* (*Zygopetalum*) *Wendlandii discolor* (votes unanimous), from Sir Jeremiah Colman, Bart., Gatton Park, Surrey. See p. 373.

Cultural Commendation.

To Mr. Dunster, Orchid grower to E. R. Ashton, Esq., Broadlands, Tunbridge Wells, for a well-cultivated specimen of *Brassia verrucosa*.

Other Exhibit.

Sir Jeremiah Colman, Bart., Gatton Park, Surrey: a group.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and six other members present.

Award Recommended :—

Award of Merit.

To *Rhododendron* 'Aladdin' (votes unanimous), from J. J. Crosfield, Esq., Embly Park, Romsey, Hants. See p. 372.

Other Exhibits.

Colonel H. Spender Clay, M.P., Ford Manor, Lingfield: *Rhododendron* sp.

The Rt. Hon. Lord Swaythling, Townhill Park, Southampton: *Rhododendron didymum*, *R. myrtilloides* and *R. dichroanthum* × *R. Griersonianum*.

J. J. Crosfield, Esq.: *Rhododendron* 'Red Lamp' and *R.* 'Embly Blush.'

Lionel de Rothschild, Esq., Exbury, Hants: *Rhododendron* No. 1437 and *R.* No. 4148, unnamed seedlings from the *Rhododendron* Trials at Exbury, both sent for trial by Messrs. Waterer, Sons & Crisp, Bagshot, Surrey.

DELPHINIUM SOCIETY'S SHOW.

JUNE 27, 1935.

JOINT DELPHINIUM COMMITTEE.—Mrs. H. LINDSAY SMITH in the Chair, and ten other members present.

Award of Merit.

Delphinium 'Lady Bowles,' for cutting (votes 6 for, 1 against), from Messrs. Chaplin Bros., Waltham Cross.

Delphinium 'Betty,' for cutting (votes 8 for), from Mr. T. Stevenson, Colham Green Nurseries, Hillingdon.

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Delphinium 'Laurent,' for show (votes unanimous), from Messrs. Blackmore & Langdon, Bath.

Delphinium 'Wild Wales,' for show (votes unanimous), from Messrs. Bees, Chester.

Delphinium 'Blue Beauty,' for show (votes unanimous), from Messrs. Bees.

Delphinium 'Codsall Lad,' for show (votes 8 for, 1 against), from Messrs. Bakers, Codsall, Wolverhampton.

Selected for trial at Wisley.

Delphinium Belladonna 'Esterel,' from Mrs. de Neufville, 46 Whitehall Court, S.W. 1.

Delphinium 'Lady Bowles,' from Messrs. Chaplin Bros., Waltham Cross.

Delphinium 'Laurent,' from Messrs. Blackmore & Langdon, Bath.

Delphinium 'Codsall Lad,' from Messrs. Bakers.

Other Exhibits.

T. Poole, Esq., Langley Mere, Chilworth Surrey : Delphiniums 'C. Burgoyne,' 'Edith Poole,' and 'Thomas Poole.'

Messrs. Goodliffe & Sons, Bishops Stortford : Delphinium Belladonna 'Horatius.'

Mr. T. Stevenson, Colham Green Nurseries, Hillingdon : Delphinium 'Distinction.'

H. S. Hotblack, Esq., Deale's, Cuckfield, Sussex : Delphinium 'Jubilee.'

BOOKS AND PAMPHLETS PRESENTED, PURCHASED OR REVIEWED DURING THE HALF-YEAR ENDING DECEMBER 31, 1934, AND DEPOSITED IN THE LINDLEY LIBRARY.

(Cont. from Vol. 60, p. c.)

- Ray, John. Observations topographical, moral and physiological; made in a journey through part of the Low-countries, Germany, Italy, and France: with a catalogue of plants not native of England, found spontaneously growing in those parts. Whereunto is added a brief account of FRANCIS WILLUGHBY, Esq.; his voyage through a great part of Spain. Illus. 8vo. 1673. (1)
- Catalogus stirpium exteris regionibus a nobis observatarum. See RAY, J. Observations . . . with a catalogue of plants.
- Read, Arthur D. The profession of forestry. Illus. 8vo. New York, 1934. (2)
- Recueil des plantes gravées par ordre du Roi Louis XIV. See DODART, D., & OTHERS. Mémoires.
- Reinealm, Paul. Specimen historiae plantarum. Illus. 4to. Paris, 1611. [Imperfect.] (1)
- Rexford, Eben E. Four seasons in the garden. Col. pl. Illus. 8vo. Philadelphia & London, 1907. (1)
- Robinson, William. The English flower garden. Illus. 8vo. 1883. (1)
- The virgin's bower, *Clematis*: climbing kinds and their culture at Gravetye Manor. Illus. 8vo. 1912. (1)
- Rohde, Eleanor Sinclair. Introduction. See HANMER, Sir THOS. Garden book.
- Preface. See WHEELWRIGHT, E. G. Gardening in stone.
- Rubber Growers' Association. Rubber and agriculture. Illus. 8vo. 1934.
- St. Clair-Thompson, G. W. The protection of woodlands by natural as opposed to artificial methods. Illus. 8vo. 1928. (15)
- Schinz, Christoph Salomon. See GESSNER, J. Tabulae phytographicae.
- Schmidt's russisch-deutsches . . . Taschenwörterbuch. See DICTIONARIES, RUSSIAN. MANDELKERN, S.
- Schoute, J. C. Ed. See MOLL, J. W. Phytography.
- Shewell-Cooper, Wilfred Edward. Modern flower growing for profit. 8vo. 1934. (2)
- Shoemaker, James Sheldon. Small-fruit culture. Illus. 8vo. Philadelphia, 1934. (1)
- Siebeneick, H. See RATHLEF, H. VON. Über einige Kreuzungen.
- Skene, Macgregor. School botany. 2nd ed. Illus. 8vo. Oxford, 1934. (2)
- Sloane, Sir Hans, Bart. A voyage to the islands of Madera, Barbadoes, Nieves, St. Christophers, and Jamaica; with the natural history of the herbs and trees, four-footed beasts, fishes, birds, insects, reptiles, &c., of the last of those islands, etc. 2 vols. Illus. fol. 1707-25. (1)
- Small, John Kunkel. Manual of the south-eastern flora, being descriptions of the seed plants growing naturally in Florida, Alabama, Mississippi, Eastern Louisiana, Tennessee, North Carolina, South Carolina and Georgia. Illus. 8vo. New York, 1933. (1)
- Smith, Sir William Wright. Foreword. See TAYLOR, G. Account of the genus *Meconopsis*.
- [Soulsby, Basil Harrington.] A catalogue of the works of LINNAEUS. See BRITISH MUSEUM (NATURAL HISTORY). A catalogue of the works of LINNAEUS.
- Spry, Constance. Flower decoration. With a foreword by Sir WILLIAM LAWRENCE. Col. pl. Illus. 8vo. 1934. (2)

- Stebbing, Maud Evelyn (*Mrs. E. P.*). Colour in the garden. Plants and shrubs: their uses, culture and colour-grouping. Illustrated by M. WALTHERS ANSON. Col. pls. Illus. 4to. 1934. (2)
- Stoker, Fred. Shrubs for the rock garden. (*Bull. Alpine Gard. Soc.*, ii. 8.) Illus. 8vo. 1934. (2)
- Strabo (*or* Strabus), Walahfrid. Des WALAHFRID von der Reichenau *Hortulus*, Gedichte über die Kräuter seines Klostergartens vom Jahre 827. Weidergabe des ersten Wiener Druckes vom Jahre 1510. Eingeleitet . . . von KARL SUDHOFF, H. MARZELL, E. WEIL. (Münch. Beitr. Gesch. Naturwiss.) Illus. 8vo. Munich, 1925. (1)
- See LUXMOORE, H. E. Walafrid Strabo.
- Sudhoff, Karl. Vorspruch. See STRABO, W. *Hortulus*.
- Sueur, A. D. C. Le. See LE SUEUR, A. D. C.
- Taylor, George. An account of the genus *Meconopsis*. With notes on the cultivation of the introduced species by E. H. M. Cox, foreword by Sir WILLIAM WRIGHT SMITH. Illus. 8vo. 1934. (2)
- Terracciano, Nicola. Descrizione di una nuova specie di pruno [*Prunus brutia*]. (*Atti R. Ist. Incoragg. Sci. nat. Napoli*, Ser. 4, i.) Illus. 4to. Naples, [1889]. (1)
- Intorno ad alcune piante della flora di Terra di Lavoro. (*Atti R. Accad. Sci. fis. mat. Napoli*, Ser. 2, iv, append. 2.) Illus. 4to. Naples, 1890. (1)
- Il *Ranunculus Aleae* Willk., a fiore doppio, nella flora dell' Italia meridionale. (*Atti R. Ist. Incoragg. Sci. nat. Napoli*, Ser. 4, viii.) Illus. 4to. Naples, 1895. (1)
- Intorno ad alcune specie d'Iridi [*Iris speciosa*, *I. sabina*, *I. suaveolens*] che crescono naturalmente nel mezzogiorno d'Italia. (*Atti R. Ist. Incoragg. Sci. nat. Napoli*, Ser. 5, i.) Illus. 4to. Naples, 1899. (1)
- L'*Ornithogalum montanum* Cyr. e sue forme nella flora di Monte Pollino. (*Rendicont. R. Accad. Sci. fis. mat. Napoli*, xiv.) 8vo. [Naples], 1906. (1)
- Descrizione di una novella varietà [*giganteum*] di *Lilium bulbiferum* Lin. e di un caso di fasciazione. (*Atti R. Ist. Incoragg. Sci. nat. Napoli*, Ser. 6, iii.) Illus. 4to. Naples, 1906. (1)
- Thomas, Harry Higgott. *Ed.* The popular encyclopaedia of gardening. 2 vols. Col. pl. Illus. 8vo. [1933.] (1)
- Thompson, G. W. St. Clair. See ST. CLAIR-THOMPSON, G. W.
- [Thou, Jacques Auguste de (*lat.* Thuanus).] Crambe. Viola. Lilium. Phlogis. Terpsinoe. [Verscs]. 4to. Paris, 1611. [*Bound with* RENEALM, P. *Specimen historiae plantarum.*]
- Timbal-Lagrange, Bernard Albert. Rapport sur l'herborisation des environs de Muret (Haute-Garonne). (*Bull. Soc. Sci. Nat. Toulouse*, ii.) 8vo. [Toulouse, 1874.] (1)
- Timbal-Lagrange, Edouard Pierre Marguerite. Observations sur cinquante-cinq planches inédites de la flore des Pyrénées. (*Bull. Soc. Bot. France*, xi.) 8vo. [Paris], 1864. (1)
- Recherches sur les variations que présentent quelques plantes communes de la Haute-Garonne au point de vue phytographique. (*Mém. Acad. Toulouse*, Ser. 6, iv.) 8vo. [Toulouse], 1866. (1)
- II. (*Mém. Acad. Toulouse*, Ser. 7, ii.) 8vo. [Toulouse, 1870.] (1)
- Observations sur quelques *Dianthus* des Pyrénées. (*Mém. Acad. Toulouse*, Ser. 6, v.) 8vo. Toulouse, 1867. (1)
- Précis des herborisations faites . . . pendant l'année 1869. (*Bull. Soc. Hist. Nat. Toulouse*, iii.) 8vo. Toulouse, 1870. (1)
- Précis des herborisations faites . . . pendant l'année 1870. (*Bull. Soc. Hist. Nat. Toulouse*, iv.) 8vo. Toulouse, 1871. (1)
- Étude sur quelques campanules des Pyrénées. (*Mém. Acad. Toulouse*, Ser. 7, v.) 8vo. Toulouse, 1873. (1)
- Reliquiae Pourretianae. (*Bull. Soc. Sci. Phys. Nat. Toulouse*, ii.) Illus. 8vo. Toulouse, 1875. (16)

- Timbal-Lagrange, Bernard Albert.** Du *Ligularia sibirica* Cass. dans les Pyrénées. (Bull. Soc. Bot. France, xxv.) 8vo.- [Paris], 1878. (1)
- Étude sur de nouvelles planches inédites de la flore des Pyrénées de LAPEYROUSE. (Mém. Acad. Toulouse, Ser. 8, vii.) 8vo. Toulouse, 1885. (1)
- Tirocco, G. B.** La camelia. 8vo. Catania, 1928. (15)
- Trew, Christoph Jakob.** Plantae rarioris quas maximam partem ipse in horto domestico coluit . . . ulterius expendit et maxima ex parte descripsit D. BENEDICTUS CHRISTIANUS VOGEL secundo textum excudendum curante ADAMO LUDOVICO WIRSING. Dec. 3 (in 1 vol.). Col. pls. fol. Nürnberg & Aldorf, [1764-]1795. (1)
- Tusser, Thomas.** His good points of husbandry. Ed. by DOROTHY HARTLEY. Col. pl. Illus. 8vo. (1931.) (1)
- Unwin, Charles William.** Illustrations and dissections of the genera of British mosses. Illus. fol. Lewes, 1878. (1)
- Velenovsky, Josef.** Une plante ottomane nouvelle, *Myosotis macedonica* (Velenovsky et Charrel). (Compte-Rendu Soc. Sci. Bohême.) 8vo. Prague, 1893. (6)
- Vercier, J.** La détermination rapide des variétés de fruits. Comment trouver soi-même le nom d'un fruit ? Poires, pommes. Illus. 8vo. Paris, 1934. (1)
- Cerises, fraises. Illus. 8vo. Paris, 1934. (1)
- Viguié, Marie Thérèse, & Gaussen, Henri.** Révision du genre *Abies*, 1-3. (Bull. Soc. Hist. Nat. Toulouse, lvii, lviii.) Illus. 8vo. Toulouse, 1929. (1)
- Vogel, Benedict Christian.** See TREW, C. J. Plantae rarioris. Dec. 2-3.
- Wagner, Hermann, Botanist.** Illustrierte deutsche Flora. Eine Beschreibung der im Deutschen Reich, Deutsch-Österreich und der Schweiz einheimischen Gefäßpflanzen. Nach der von AUGUST GARCKE besorgten 2. Auflage . . . verbessert [von ROBERT GRABMANN]. (1)
- Walahfrid, of Reichenau.** See STRABO, WALAHFRID.
- Wallisch, K.** See WROBLEWSKI, A. Spozrzenia.
- Ward, F. Kingdon.** Field notes of Rhododendrons and other plants collected by KINGDON WARD in 1933. 8vo. [1934.] (1)
- (Another copy.)
- Weil, Ernst.** See STRABO, W. Hortulus.
- Wheeler, James Lowe.** Catalogus rationalis plantarum medicinalium in horto Societatis Pharmaceuticae Londinensis, apud vicum Chelsea, cultarum. 8vo. 1930. (6)
- Wheelwright, Edith Grey.** Gardening in stone, a guide to the upkeep of wall gardens and pavings. With a preface by ELEANOUR SINCLAIR ROHDE. Illus. 8vo. (1934.) (2)
- Wiger, Johan.** Embryological studies on the families Buxaceae, Meliaceae, Simarubaceae, and Burseraceae. Thesis. Illus. 8vo. Lund. 1935. (3)
- Wight, Robert.** Illustrations of Indian botany. 2 vols. Col. pls. 4to. Madras, 1838. (1)
- Willughby, Francis.** Voyage through a great part of Spain. See RAY, J. Observations. (1)
- Wirsing, Adam Ludwig.** See TREW, C. J. Plantae rarioris. Dec. 2-3.
- Wood, Joseph.** A synopsis of the British species of *Rosa*. (Trans. Linn. Soc., Lond. xii.) 4to. (1)
- Wormald, H.** The brown-rot diseases of fruit trees. Min. Agr. London, Bull. 88. 1935. (2)
- Wright, Samuel Thomas.** Fruit culture for amateurs. With notes on injurious insects and fungi by W. D. DRURY. 5th ed. Illus. 8vo. [19—.] (1)
- Wroblewski, Antoni.** Wpływy zimy 1928-29 na roślinność drzewiasta w Korniku. Les effects de l'hiver 1928-29 sur les végétaux arborescentes aux Jardins et Arboretum de Kórnik. (Ann. Soc. Dendr. Pologne, iii.) Illus. 8vo. Lwów, 1930. (3)

- Wroblewski, Antoni, & Wallisch, K.** Spostrzezenia aklimatyzacyjnohodowlane nad topolami. Observations sur l'acclimatation et la culture du genre *Populus*. (Ann. Soc. Dendr. Pologne, iii.) Illus. 8vo. Lwów, 1930. (3)
- Zannichelli, Gian Girolamo.** Istoria delle piante che nascono ne' lidi intorno a Venezia. Opera postuma di GIAN GIROLAMO ZANNICHELLI, accresciuta da GIAN JACOPO figliuolo dello stesso. Illus. fol. Venice, 1735. (1)
- Zannichelli, Gian Jacopo.** Ed. See ZANNICHELLI, G. G. Istoria.

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

Fellows are reminded that these Notes form the vehicle by which the Society conveys to them information regarding any alterations or additions in the Society's activities. Although undoubtedly the notes are appreciated by many, there are still a number of Fellows of the Society who do not appear to have discovered their usefulness. It would be of great assistance if those Fellows who have found these notes of value to them would bring them to the notice of their friends.

In the case of the change of venue of the Sweet Pea Society's Show from the Society's Hall to the Alexandra Park, Hastings, in spite of the fact that this change was commented upon three times in the JOURNAL (in the May, June and July issues), yet a great number of Fellows, through seeing no mention of it, came up to visit the Show and were disappointed.

SOFT FRUIT AND CHERRY CONFERENCE.

The Soft Fruit and Cherry Conference, which was held on July 16 and 17, was well attended, not only by growers but also by a considerable number of amateur gardeners, who took the opportunity of listening to the discussions.

In the absence of Lord ABERCONWAY, the President of the Society, Sir DANIEL HALL, K.C.B., took the Chair at the first session, and gave an account of the gradual development in soft fruit growing in this country, and of its importance. He welcomed the efforts of the Society in trying to bring together all the knowledge gained from recent experience.

The two subjects for discussion on the first afternoon were Cherries and Strawberries. Mr. DOUBLEDAY, supported by Mr. BUNYARD and Mr. BRIDGES DIXON, gave a full account of the varieties at present suitable for market-growing purposes, and the best varieties for other purposes were mentioned. The subject of planting, and the forms of trees also came up for discussion.

With regard to Strawberries, Mr. RONALD VINSON, supported by Dr. SWARBRICK, Mr. A. M. MASSE, Mr. C. H. OLDHAM, and Mr. T. R. C. BLOFELD, discussed the methods of growing healthy strawberries, and sound practical advice can be obtained by reading the opening paper and the discussion which followed. Not only was information given on the varieties which hold the premier position, but the troubles and diseases met in cultivation were dealt with in detail, and also methods of planting.

On Wednesday, July 17, with Mr. H. V. TAYLOR, O.B.E., Commissioner for Horticulture to the Ministry of Agriculture and Fisheries, in the Chair, Dr. WALLACE read an important paper on the nutrition and manuring of soft fruits. He touched on the value of dung and chemicals, and the significance of the absence or presence of potash, and gave some practical information as to which fruits benefit most from certain methods of manuring. The paper contained

tabular statistics showing some remarkable facts on the subject of manuring, which should prove of high importance both to the commercial grower and to the amateur gardener.

The second paper discussed at this session was by Mr. R. V. HARRIS on "Growing Healthy Raspberries," and he was followed by Mr. J. MCINTYRE and Mr. G. C. JOHNSON. This subject was treated from a highly practical point of view, and much sound advice was imparted. Mr. MCINTYRE especially laid stress upon the practical methods which had been employed in growing Raspberries in Scotland, being the result of his forty years' experience with this fruit.

At the afternoon session, when Sir WILLIAM LOBJOIT, O.B.E., J.P., V.M.H., Chairman of the Fruit and Vegetable Committee of the National Farmers' Union, presided, Mr. A. N. RAWES introduced the subject of "Soft Fruits for the Private Garden," and was followed by Mr. R. H. HALL and Mr. T. E. TOMALIN. Under this subject, a description of the best varieties to grow was given in such detail as to prove of use to amateur gardeners, whether they grow on a large or small scale, and the original paper and ensuing discussion should do much to encourage the growing of soft fruits in the private garden.

Mr. M. B. CRANE opened the next discussion, on the subject of "Blackberries and like berries for garden purposes" and showed the gradual development of the hybrid berries now obtainable. Miss BEAKBANE followed, giving particulars of the growing habits of the various kinds on the market. Her address was well illustrated with photographs.

The last paper of the Conference, on "The Bottling of Soft Fruits," was dealt with in a practical manner by Miss E. M. GUNNELL, and is, of course, of importance to the amateur grower who desires to preserve the surplus fruit from his garden for winter and spring use.

The report of the Proceedings of the Conference will be published shortly in book form under the title of "Cherries and Soft Fruits: Varieties and Cultivation in 1935," thus forming a companion volume to "Apples and Pears: Varieties and Cultivation in 1934," which was the report of the proceedings of the Conference held last year at the Crystal Palace. It is anticipated the price will be about 6s. Persons desirous of obtaining a copy are asked to apply to the Secretary at an early date, in order that the number to be printed may be more easily estimated.

INSPECTION OF GARDENS.

Many Fellows may not be aware of the terms under which their Gardens can be inspected by the Society's Garden Inspector, and advice given thereon. They are set out below, and it will be seen that special arrangements can be made when Fellows living in the same district co-operate.

"The inspection of Gardens belonging to Fellows is conducted by a thoroughly competent Inspector from the Society, who reports and advises at the following cost, viz.: a fee of £3 3s. for one day (or £5 5s. for two consecutive days), together with all out-of-pocket expenses. No inspection may occupy more than two days, save by special arrangement. Should two or more Fellows residing in the same district, with their Gardens within easy reach of one another, desire to have the services of the Garden Inspector, arrangements will be made for such a combined inspection and the fee and expenses divided by consent of those concerned. Fellows wishing for the services of an Inspector are requested to give at least a week's notice and choice of two or three days, and to indicate the most convenient railway station and its distance from their Garden. Gardens can only be inspected at the *written* request of the owner."

ERLESTOKE PARK, WILTSHIRE.

In view of the numerous inquiries that are still being made at this office, it appears desirable to repeat the following paragraph which we have published in previous numbers of the Monthly JOURNAL under Notices to Fellows:

"In view of inquiries received and in order to avoid any misunderstanding on the part of the Fellows of the Royal Horticultural Society, the Council of the Society wishes it to be known that the appeal which has been made in connexion with Erlestoke Park, Wiltshire, has not been in any way made with the support or under the auspices of the Society."

FRUIT FOR NAMING.

At this time of the year there is always a large amount of fruit sent to the Committee for naming, and Fellows are reminded of the following instructions

which, if adhered to, will materially assist the Committee in their task of identification, and thus save Fellows from being disappointed owing to the Committee being unable to identify the fruit from the samples sent.

"Send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how they are grown, e.g. indoors or out, as cordons, bushes or standards, etc."

CALENDAR.

September 6, 2.30–9 P.M., and *September 7*, 2.30–6.30 P.M.—London Gardens' Society Exhibition of flowers.

September 10, 1–6 P.M.—Fortnightly meeting. Dahlias and early Chrysanthemums will be the chief flowers at this show.

Alpine Garden Society's Show in the Old Hall.

At 3.30 P.M. on Tuesday, *September 10*, in the Lecture Room of the New Hall, Dr. FRED SIOKER, F.L.S., will speak on "The Cultivation of Ericaceous Plants."

September 13, 12 NOON–7 P.M., and *September 14*, 11 A.M.–5 P.M.—National Rose Society's Show. Fellows will remember that this Show will be on a large scale as it takes the place of the usual Rose Show at Chelsea which unfortunately had to be postponed on account of the climatic conditions that obtained during the month of May. At this Show there will be special competitive classes, and Fellows and Associates of this Society will be admitted free of charge on presentation of their membership tickets.

September 25, 26 and 27.—Autumn Show, National Hall, Olympia. (See special paragraph below.)

October 1.—Entries for the Fruit and Vegetable Show, to be held on *Oct. 8*, close.

October 2 and 3.—Practical examination for the British Floral Art Diploma. On the afternoon of *October 3* at 2.30 the work of the candidates will be on view.

October 8, 1–7.30 P.M., and *October 9*, 10 A.M.–4 P.M.—The Fruit and Vegetable Show will be held in both the New and Old Halls. This is a competitive show for the amateur gardener, supported by non-competitive trade exhibits. Schedules for the show are obtainable on application to the Secretary.

In the afternoon of *October 8* at 3.30 in the Lecture Room of the New Hall, Mr. G. FOX WILSON will lecture on "Fruit Pests: their Effect and Detection," and there will be a special exhibit from Wisley on view at the Show, entitled "Pests and Diseases of Fruit and Vegetables."

October 15, 1–7.30 P.M., and *October 16*, 10 A.M.–4 P.M.—Fortnightly Meeting. At this Show may be seen the last of the hardy herbaceous flowers; orchids will be again coming into prominence, and should the weather conditions be favourable, many beautiful shrubs will be on show.

At 3.30 P.M. on *October 15*, in the Lecture Room of the New Hall, Mr. E. L. HILLIER, Junior, will lecture on "Some Outstanding New and Little-known Trees and Shrubs." This will be well illustrated by lantern slides, and it should be of great practical use to Fellows thinking of autumn planting.

In the Restaurant of the Old Hall, at 4.30 P.M., the Lily Group will meet to discuss "Planting of Lilies."

October 15, 16 and 17.—Special Exhibition of Paintings and Drawings of Plants, Flowers and Gardens in the Old Hall. Fellows interested in this exhibition are requested to apply to the Secretary. (See also special paragraph, p. cxxxvi.)

AUTUMN SHOW.

The Autumn Show is the second largest annual show which the Society arranges, and as the Chelsea Show is important for the commencement of the year, bringing together all the spring flowers, so the Autumn Show is of similar importance in gathering together all the autumn flowers and beautiful shrubs of autumn colouring. The Autumn Show forms a meeting place for all Fellows who are anxious to restock their gardens for the coming planting season.

CXXXVI PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

The particulars of the hours of admission to the Show are given below, and Fellows will also find them on their Fellowship tickets :

September 25, 11 A.M.—9.30 P.M.

„ 26, 10 A.M.—9.30 P.M.

„ 27, 10 A.M.—5.0 P.M.

The prices of admission for non-fellows are :

September 25, 11 A.M.—2 P.M., 10s.

2 P.M.—6 P.M., 5s.

6 P.M.—9.30 P.M., 2s. 6d.

„ 26, 10 A.M.—6 P.M., 2s. 6d.

6 P.M.—9.30 P.M., 1s.

„ 27, 10 A.M.—5 P.M., 1s.

The two Challenge Cups for competition at the Autumn Show are : the Coronation Cup, which was founded in 1911, and is offered for the best exhibit at the Show ; and the Wigan Cup, presented to the Society by Mr. A. L. WIGAN in 1911, and offered for the best exhibit of roses staged.

Applications for special tickets for Gardeners should be made to the Secretary.

ADDITIONAL SHOW.

Alpine Garden Society.

Fellows are asked to note that there will be a Show arranged by the Alpine Garden Society on *September 10* in the Old Hall from 1–6 P.M. This Show has been arranged since the calendar was printed. Fellows' tickets will admit.

EXHIBITION OF PAINTINGS AND DRAWINGS OF PLANTS, FLOWERS AND GARDENS.

(Photographs, plans, and models excluded.)

A special exhibition of paintings and drawings of plants, flowers and gardens will be held in the Old Hall on *October 15, 16 and 17.*

According to preliminary arrangements, *October 3* will be the latest date for the receipt of entries, and on *October 9* the office will be open for the reception of exhibits. On Thursday and Friday, *October 10 and 11*, the Hanging Committee will sit, and on Monday, *October 14*, the exhibition will be open for a Press View. On Tuesday, Wednesday and Thursday, *October 15, 16 and 17*, the exhibition will be open to Fellows and the general public.

All Fellows interested in this show are asked to write to the Secretary for full particulars with regard to the regulations governing exhibition.

HALL LETTINGS.

On *September 3 and 4*, the British Bee Keepers' Association are holding their Annual Exhibition in the Old Hall, when there will be competitive classes for Honey, and demonstrations.

From *September 19–28* the Old Hall has been let for the purposes of a Model Engineering Exhibition, which is very popular with schoolboys and their parents. Any further particulars may be obtained from Messrs. Percival Marshall & Co., Ltd., 13–16, Fisher Street, W.C. 1.

The New Hall has been let from *September 23–27* for The Chemists' Exhibition, and from *October 21–25* for The Medical Exhibition. Particulars may be had from "The British & Colonial Druggist, Ltd.," 194–200, Bishopsgate, E.C. 2.

Fellows may be interested to hear that the New Hall has been taken by The National Federation of Women's Institutes from *November 13–20* when they are to stage a large collective exhibition of the work of the Institutes. Particulars are obtainable from The National Federation of Women's Institutes, 39, Eccleston Street, S.W. 1.

BORDER CARNATIONS FOR GARDEN PURPOSES.

It has been decided that in conjunction with the National Carnation and Picotee Society trials of Border Carnations for garden purposes shall be carried out at Wisley.

It will therefore be necessary to establish a standard collection there, and amateurs, trade growers and raisers are invited to co-operate in this undertaking and to send the names of varieties they are prepared to contribute to the collection.

The names of the varieties should be entered on forms to be obtained either from the Society's office at Vincent Square, Westminster, S.W. 1, or from the Society's Gardens at Wisley, and the forms should be returned to either of the

addresses not later than *September 21, 1935*. A Committee will then scrutinize the lists and select varieties required for the standard collection, and the contributors will be asked to send three well-rooted plants to the Director of the Gardens at Wisley, Ripley, Surrey (goods via Horsley Station, Southern Railway), between *October 1 and 15, 1935*.

The first judging in 1936 will be upon the varieties grown for the standard collection and thereafter the collection will be maintained from year to year and used for comparative purposes in connexion with awards proposed for plants selected for trial by the Joint Committee of the two Societies.

WISLEY GARDENS IN SEPTEMBER.

The Herbaceous Border still contains many late flowering plants and will continue its brightness for some time. The principal genera in flower include *Helianthus*, *Helenium*, *Kniphofia*, *Aster*, *Boltonia*, *Chrysanthemum* and *Salvia*.

In the Seven Acres foliage of shrubs and trees will now be rapidly taking on its autumn tints, but at this season few will be in flower. A considerable number of shrubs will also be beginning to show their crops of fruits of varied colour and form, the bright sunshine combined with the absence of rainfall having hastened their maturity.

In the Heather Garden a large variety of *Erica* and *Calluna* may be seen; numerous forms of the cross-leaved, Cornish, Dorset, and Bell Heathers, as well as *St Daboec's Heath* (*Daboecia*), planted as they are in large groups, form attractive patches of colour.

On the Rock Garden and in the Alpine House the majority of genera have already finished their flowering. Those which may still be expected at this late season comprise late flowering *Gentians*, a few species of *Cyananthus*, and *Cyclamen* of the autumn flowering section.

Of the trials in progress the long borders containing *Dahlias* in their many varieties may now prove interesting. They are represented in their various sections by many coloured varieties both of the newer as well as those of older known established value.

The Michaelmas Daisies growing near the *Dahlias* will also be at their best this month, and the space devoted to these plants contains varieties of various heights and colours.

GENERAL MEETINGS.

JULY 2, 1935.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and five other members present.

Proliferous Meconopsis.—Mr. Heal sent from Devonshire specimens of *Meconopsis quintuplinervia* showing growth of the central axis through the original flower producing a second flower above the first. He also sent a double flower of this species.

Petaloid stamens in Papaver.—Some flowers of *Papaver nudicaule* in which the stamens were all transformed into narrow petaloid growths were shown. Similar malformations have been before the Committee on former occasions

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and seven other members present.

Exhibit.

Commercial Fruit Trials, R.H.S. Gardens, Wisley; Strawberry 'Western Queen.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Bath, Wisbech, for Pæonies.

To Messrs. Blackmore & Langdon, Bath, for Delphiniums.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Baker, Wolverhampton, for Delphiniums.

To Messrs. Barr, London, for Pæonies, Irises and other herbaceous plants.

To Messrs. Chaplin, Waltham Cross, for Delphiniums.

To Mr. E. Ladhams, Elstead, for herbaceous plants and Water Lilies.

To Messrs. Sutton, Reading, for annuals.

Silver Banksian Medal.

To Mr. T. Bones, Cheshunt, for Delphiniums.

To Donard Nursery Co., Newcastle, Co. Down, for Roses.

To Messrs. Engelmann, Saffron Walden, for Carnations and Zinnias.

To Messrs. Prichard, Christchurch, for herbaceous plants.

To Messrs. Russell, Richmond, for greenhouse plants.

To Suffolk Seed Stores, Woodbridge, for herbaceous plants.

Banksian Medal.

To Mr. Archer and daughter, Sellindge, for Roses.

To Messrs. Bentall, Havering, for Roses.

To Messrs. Carter, Raynes Park, for *Statice puberula*, etc.

To Messrs. Gibson, Cranleigh, for Dianthus.

To Messrs. Hayward, Clacton, for Dianthus and other herbaceous plants.

To Mr. Gavin Jones, Letchworth, for herbaceous plants.

To Mr. A. Miles, Bickley, for herbaceous plants.

To Mr. G. E. P. Wood, Ashted, for Delphiniums, etc.

Award of Merit.

To *Campanula grandis*, Highcliffe var., as a hardy border plant (votes 7 for, 2 against), from Messrs. Prichard, Christchurch. See p. 418.

Selected for trial at Wisley.

Iris laevigata 'Rose Queen,' from Mr. Ladhams, Elstead.

Oenothera 'Yellow River,' from Messrs. Prichard, Christchurch.

Other Exhibits.

Messrs. Bunyard, Maidstone: old-fashioned Roses.

Mr. A. C. B. Ker, New Haw, Surrey: Roses.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-five other members present.

Awards Recommended :—

Gold Medal.

To the Rt. Hon. Lord Swaythling, Southampton, for Lilies.

Silver-gilt Banksian Medal.

To Mr. W. A. Constable, Southborough, for Lilies.

Silver Flora Medal.

To Hocker Edge Gardens, Cranbrook, for Lilies, Irises and other herbaceous plants.

Flora Medal.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Mr. Amos Perry, Enfield, for Alliums, Calochorti and other hardy plants.

To Messrs. Wallace, Tunbridge Wells, for Lilies and other herbaceous plants.

Lindley Medal.

To J. E. H. Stooke, Esq., Hereford, for hybrid Lilies.

Banksian Medal.

To the Duke of Abercorn, Barons Court, Co. Tyrone, for Lilies.

To Mr. E. A. Britton, Tiverton, for alpine plants.

To Letchworth Plants, Ltd., Letchworth, for alpine plants.

To Messrs. Prichard, Christchurch, for alpine plants.

To Messrs. Reuthe, Keston, for shrubs and alpine plants.

To Mr. J. Robinson, Eltham, for alpine plants.

To Messrs. Rogers, Southampton, for alpine plants.

Award of Merit.

To *Anthemis Sancti-Johannis* as a hardy flowering plant (votes 18 for, 5 against), from N. K. Gould, Esq., West Byfleet. See p. 418.

To *Campanula pilosa* as a flowering plant for the rock garden and alpine house (votes 17 for, 6 against), from Lt.-Col. C. H. Grey, D.S.O., Cranbrook. See p. 418.

To *Dracocephalum Isabellae* as a hardy flowering plant (votes 12 for), from C. T. Musgrave, Esq., Godalming. See p. 420.

To *Jacaranda ovalifolia* as a flowering shrub for the greenhouse (votes 14 for, 5 against), from Mrs. Raymond Courage, Banbury. See p. 421.

To *Lilium* × 'Grace Marshall' as a hardy flowering plant (votes 16 for), from Lt.-Col. G. S. F. Napier, Horam, Sussex. See p. 421.

To *Rhododendron* × 'Cinnocrass' as a hardy flowering shrub (votes 15 for, 4 against), from E. J. P. Magor, Esq., St. Tudy, Cornwall. See p. 422.

Other Exhibits.

Miss C. Beck, Ware : *Iris spuria*.

Mrs. S. E. Bray, Sevenoaks : *Pentstemon utahensis*.

Brookside Nurseries, Oxford : *Campanula Rainieri alba*.

Messrs. Carter, Raynes Park : *Statice puberula*.

Mr. A. Corderoy, Eltham : alpine plants.

Capt. Ambrose Dunston, Donhead St. Mary : *Lilium Martagon* × *L.*

Hansonii.

T. Hay, Esq., Hyde Park : *Kniphofia vomerensis*.

Miss Hopkins, Coulsdon : hardy plants.

Collingwood Ingram, Esq., Benenden : *Rosa filipes*, *Gladiolus callistus* ×

G. cardinalis, *G. cuspidatus* × *G. cardinalis*.

Mr. R. D. Lainson, Piltdown : *Diplacus glutinosus*, *Aster Pappoi*.

Mrs. Robert Lukin, Burghfield Common : *Asteriscus maritima*.

Lt.-Col. G. S. F. Napier, Horam : *Lilium* × 'Lilian Cummings,' *L.* × 'Lyla McCann.'

Mr. Amos Perry, Enfield : *Hemerocallis Forrestii*, *Tulbaghia violacea*.

Lady Rayleigh, Chelmsford : *Dracocephalum Isabellae*.

Messrs. Reuthe, Keston : *Azalea eriocarpa* 'Gumpo' var. *rubriflora*.

The Duke of Richmond and Gordon, Goodwood : *Myosotis azorica*.

Viscountess St. Cyres, Walhampton : *Lomatia tinctoria*, *Coriaria japonica*.

J. G. Vautier, Esq., Beckenham : *Anthemis sp.*

Messrs. Wallace, Tunbridge Wells : *Verbascum nigrum*.

Mrs. C. M. Whittall, Haslemere : *Cornus Kousa*.

Mr. R. Colpoys Wood, West Drayton : shrubs.

cxl PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and thirteen other members present.

Awards Recommended :—

Award of Merit.

To *Vanda* × 'Memoria T. Iwasaki' (*Dearei* × *tricolor*) (votes 9 for, 4 against), from Messrs. Charlesworth, Haywards Heath. See p. 422.

To *Vuylstekeara* × 'Hegira' (*Odontoglossum* × 'Purple Queen' × *Vuylstekeara* × 'Memoria J. Charlesworth') (votes 9 for, 4 against), from Messrs. Charlesworth. See p. 422.

To *Aerides odoratum album* (votes unanimous), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey. See p. 418.

Cultural Commendation.

To *Oncidium Claesii* (votes 8 for, 3 against), from Messrs. Charlesworth, Haywards Heath.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

JOINT DELPHINIUM COMMITTEE.—Mr. D. INGAMELLS in the Chair, and seven other members present.

Award Recommended :—

Award of Merit.

To Delphinium 'Italia' for show (votes unanimous). Raised and shown by Messrs. Blackmore & Langdon, Bath. See p. 419.

Selected for Trial at Wisley.

Delphinium 'H. A. Perkins,' from H. A. Perkins, Esq., Lane House, Bognor Regis.

Delphiniums 'Madge,' 'Isla,' 'Italia,' from Messrs. Blackmore & Langdon.

Delphinium 'Sonia Hotblack,' from H. S. Hotblack, Esq., Deales, Cuckfield.

Other Exhibits.

A. Miles, Esq., Southborough Jersey, Beckley : Delphinium 'H. M. Clarke.'

H. S. Hotblack, Esq., Deales, Cuckfield : Delphinium 'Grace Dance.'

JULY 9, 1935.

JOINT DELPHINIUM COMMITTEE.—Mr. A. J. MACSELF in the Chair, and three other members present.

Selected for Trial at Wisley.

Delphinium 'Elizabeth Rickett,' from A. R. N. Rickett, Esq., Woodruffe, Worplesdon Hill, near Woking.

JULY 16, 1935.

SCIENTIFIC COMMITTEE.—Mr. A. D. COTTON, O.B.E., F.L.S., in the Chair, and three other members present.

Fasciated Holly.—A fasciated branch of Holly was shown by the Secretary. The fasciation was confined in this instance to the plain-leaved part of the bush. He also showed a

Fasciated Veronica of the herbaceous section with a stem $3\frac{1}{2}$ inches wide, bearing numerous narrow linear leaves (so that, laid flat, the growth resembled turf) and at the top numerous flowers.

Contorted Primula.—Mr. C. T. Musgrave of Hascombe sent a curiously contorted stem of *Primula capitata*. In addition to the spiral twisting of the stem, the inflorescence showed besides flowers a number of foliage leaves.

Campanula Kolenatiana was sent for identification from Floral Committee B, having been submitted by Mr. Miller of Sevenoaks. The plant received A.M. in 1918.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twenty-one other members present.

Awards Recommended :—

Silver-gilt Hogg Medal.

To Messrs. Rivers, Sawbridgeworth, for pot-grown Cherries.

Other Exhibits.

Studley College, Warwickshire : Apples from Orchard House.

Mr. W. Cranston, Melrose : Strawberry 'Improved Sir Joseph Paxton.'

John Innes Horticultural Institution, Merton : Seedling Cherries.

Lt.-Col. G. E. Todd, Brooke, Norwich : Raspberry 'Todd's Cardinal.'
Commercial Fruit Trials, R.H.S. Gardens, Wisley : Red Currants 'Laxton's No. 1' and 'Earliest of Fourlands'; Black Currants 'Westwick Choice,' 'Wellington XXX'; Berries 'Phenomenal Berry,' 'Youngberry.'

An exhibition of South African Citrus Fruits in season was staged by the Imperial Fruit Show, Ltd.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Daniels, Norwich, for Larkspurs.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Bath, Wisbech, for *Lilium regale*, Pæonies, etc.

To Messrs. Dickson, Newtownards, for Roses.

To Messrs. Dobbie, Edinburgh, for Larkspurs.

To Messrs. Dobbie, Edinburgh, for Roses.

Silver Banksian Medal.

To Messrs. Barr, London, for herbaceous plants.

To Messrs. Gibson, Cranleigh, for Border Carnations.

To Messrs. Hillier, Winchester, for herbaceous plants and shrubs.

To Mr. E. Ladhams, Elstead, for herbaceous plants.

To Messrs. Prichard, Christchurch, for herbaceous plants.

To Messrs. Waterer, Sons & Crisp, Twyford, for herbaceous plants.

Flora Medal.

To Mr. Archer and daughter, Sellindge, for Roses.

To Mr. J. Douglas, Great Bookham, for Border Carnations.

To Messrs. Laxton, Bedford, for Roses.

To Messrs. S. Low, Enfield, for Carnations and other greenhouse plants.

To Messrs. Perry, Enfield, for new hardy plants.

To Messrs. Stark, Fakenham, for Poppies and herbaceous plants.

Banksian Medal.

To Messrs. Bentall, Havering, for Roses.

To Messrs. B. R. Cant, Colchester, for Roses.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. A. C. B. Ker, New Haw, Surrey, for Roses.

To Mr. A. Miles, Bickley, for herbaceous plants.

To Messrs. Proctor, Chesterfield, for Roses.

To Mr. G. E. P. Wood, Ashted, for Delphiniums, etc.

Award of Merit.

To *Alstroemeria aurantiaca* 'Dover Orange' for market and cutting (votes 12 for), from Messrs. Clark, Dover. See p. 418.

To Rose 'Percy Izzard' (votes 14 for), from Mr. H. Robinson, Hinckley. See p. 422.

Selected for trial at Wisley.

Astilbe 'Fanal,' from Messrs. Prichard, Christchurch.

Erigeron glaucum 'Elstead Pink,' from Mr. E. Ladhams, Elstead.

Godetia 'Flame,' from Messrs. Stark, Fakenham.

Nigella 'Dragon Fly,' from Mrs. A. F. Barton, Chappel.

Sidalcea 'Interlaken,' from Mr. R. C. Notcutt, Woodbridge.

Tradescantia 'Blue Stone,' from Messrs. Prichard, Christchurch.

Other Exhibits.

Miss S. Bishop, Englefield Green : Delphinium 'Wingfield.'

Messrs. Clark, Dover : Alstroemerias, etc.

Mr. L. S. Harbutt, Wickhambrook : Gaillardias.

Messrs. Kelway, Langport : Gladioli.

Mr. F. Lansdell, Saltdean : Dianthus 'Rosemary.'

Messrs. Prichard, Christchurch : *Chrysanthemum maximum* 'Beauté Nivelloise.'

Messrs. Proctor, Chesterfield : Rose 'Limelight.'

Mr. R. S. Skelton, Pirbright : Rose 'Lady Beatrice Skelton.'

Messrs. Stark, Fakenham : *Papaver nudicaule*, Fakenham hybrid 'Apricot'; Annual Statice 'Artistic.'

Mrs. B. G. Wort, Purley : Delphinium 'Emily Wort.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Wallace, Tunbridge Wells, for Lilies and other herbaceous plants.

Silver Flora Medal.

To Hocker Edge Gardens, Cranbrook, for Lilies and other herbaceous plants.

Silver Banksian Medal.

To Mr. W. A. Constable, Southborough, for Lilies.

To Messrs. Russell, Richmond, for Ixoras and other greenhouse plants.

Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for *Sempervivums*.

To Messrs. Prichard, Christchurch, for rock plants.

To Mr. J. Robinson, Eltham, for rock plants.

To Messrs. Russell, Richmond, for *Nymphaeas*.

Award of Merit.

To *Campanula × rotarvatica* as a flowering plant for the rock garden and alpine house (votes unanimous), from R. C. Tyler, Esq., Chaldon. See p. 418.

To *Evolvulus alsinoides* as a hardy flowering plant (votes 111 for), from T. Hay, Esq., Hyde Park, London, W. 2. See p. 420.

To *Helichrysum bracteatum* as a hardy flowering plant (votes unanimous), from Mr. Ernest Ladhams, Elstead. See p. 420.

To *Linum hirsutum* as a hardy flowering plant (votes unanimous), from the Director, R.H.S. Gardens, Wisley. See p. 421.

Preliminary Commendation.

To *Moraea* sp. as a hardy flowering plant (votes unanimous), from T. T. Barnard, Esq., Wareham.

Other Exhibits.

T. T. Barnard, Esq., Wareham : *Wachendorfia paniculata*, *Albuca major*, *Watsonia angusta* × W. 'Stanford's Orange.'

Mr. A. Corderoy, Eltham : rock plants.

Miss Hopkins, Coulsdon : rock plants.

F. W. Millard, Esq., Felbridge : *Mimulus primuloides*.

H. F. R. Miller, Esq., Sevenoaks : *Campanula Kolenatiana* (A.M. 1918).

Mr. R. C. Notcutt, Woodbridge : *Trollius patulus yunnanensis*.

Messrs. Rogers, Southampton : rock plants.

L. de Rothschild, Esq., Exbury : *Plagianthus Lyallii*.

Messrs. Russell, Richmond : *Achimenes* 'Kitty Russell.'

Mrs. K. H. Wright, Haywards Heath : *Mimulus moschatus*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and nine other members present.

Awards Recommended :—

Award of Merit.

To *Cattleya* × 'Lorna' var. 'Corona' ('Enid' × *Warscewiczii*) (votes 7 for), from N. Prinsep, Esq., The Boxes, Pevensey. See p. 419.

To *Cypripedium* × 'Clair de Lune' ('Alma Gevaert' × 'Emerald') (votes 7 for, 2 against), from Mr. D. A. Cowan, 118 Hook Rise, Surbiton. See p. 419.

To *Epidendrum subpatens* (votes unanimous), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey. See p. 420.

Preliminary Commendation.

To *Odontoglossum* × 'Dauphin' var. 'Alaska' (*crispum* × 'L'Empereur') (votes 6 for), from Messrs. Armstrong & Brown, Tunbridge Wells.

Other Exhibit.

Messrs. Armstrong & Brown, Tunbridge Wells : a group.

JOINT BORDER CARNATION COMMITTEE.—Mr. J. M. BRIDGEFORD in the Chair, and six other members present.

Awards Recommended :—

Award of Merit.

To Border Carnation 'Happiness' (votes unanimous). Shown by Messrs. Allwood Bros., Haywards Heath, Sussex. See p. 418.

Preliminary Commendation.

To Border Carnation 'Greatness' (votes unanimous). Yellow ground, flaked pink. Shown by Messrs. Allwood Bros., Haywards Heath.

To Border Carnation 'Betty Thain' (votes 5 for, 1 against). Cream-buff ground, flaked mauve and pink. Shown by R. Thain, Esq., Hilandale, Guildown Avenue, Guildford.

Other Exhibits.

Messrs. Allwood Bros., Haywards Heath : Border Carnation 'Glamorous.'

JOINT DELPHINIUM COMMITTEE (AT ROUNDHAY SHOW, LEEDS).—Mr. C. F. LANGDON in the Chair, and five other members present.

Awards Recommended :—

Award of Merit.

To Delphinium 'Omega' for show (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 420.

To Delphinium 'Monica Schofield' for show (votes unanimous), from E. Schofield, Esq., Leventhorpe, Woodlesford, Leeds. See p. 420.

To Delphinium 'Glory of Wales' for cutting (votes unanimous), from Messrs. Bakers, Codsall, Wolverhampton. See p. 419.

Other Exhibits.

Messrs. Bakers, Codsall, Wolverhampton : Delphiniums 'Country Girl' and 'Eldorado.'

JULY 23, 1935.

NATIONAL CARNATION AND PICOTEE SOCIETY'S SHOW.

JOINT BORDER CARNATION COMMITTEE.—Mr. J. M. BRIDGEFORD in the Chair, and nine other members present.

Awards Recommended :—

Award of Merit.

To Carnation 'Windsor Clove' for the open border (votes unanimous), shown by Mr. C. H. Cook, The Royal Gardens, Windsor. See p. 418.

To Carnation 'Renée Nichols' for show purposes (votes unanimous), shown by F. W. Nichols, Esq., Woolton, Liverpool. See p. 418.

Other Exhibits.

Carnation 'Donald,' shown by A. F. Caddy, Esq., Stanley Road, Teddington.

Carnation 'Celia Smith,' shown by Mr. C. Smith, Mansfield Woodhouse, Notts.

Carnation 'Carlton Fancy' (syn. 'Betty Thain'), shown by C. F. Hill, Esq., Small Heath, Birmingham.

JULY 30, 1935.

CLAY CHALLENGE CUP COMPETITION.

The Clay Challenge Cup, which was offered for award for a new Rose possessing the true old rose scent, was awarded to Mr. H. Robinson, Burbage, Hinckley, for Rose 'Christopher Stone.'

A lecture was given by Mr. F. R. LONG on "South African Gardens and their Flowers."

Chairman, Professor T. T. BARNARD.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and four other members present.

Gentians grown in different soils.—Dr. Tincker showed *Gentiana cruciata* grown in heavy loam and in chalk. There were large differences in growth, in height, number of flowers, time of flowering, and branching.

Hylemyia from Guildford.—Mr. Fox Wilson showed photographs of *Hylemyia (Chortophila) cilicrura* from Guildford. The pest is known as "American Seed Corn Maggot," and in this case was infesting the germinating seeds of the Runner Bean.

Heterodera marioni.—Mr. Fox Wilson also placed before the Committee records of Carrots infected with "Root Knot" (*Heterodera marioni*) Eelworm.

Distribution of Papaver radiculatum.—Professor Weiss commented on the work of a Norwegian geologist—Nordhagen—whose investigations of the climate of Scandinavia allowed him to study the distribution of *Papaver radiculatum*. He found that there was within the limits of the old species a number of very distinct forms which breed true, and he has now described four species and a number of varieties. Professor Weiss showed a form from the Faroes, a hirsute plant with a subglobose capsule. The colour of the latex of the varieties differs.

Seedling forms of Hemerocallis fulva.—Mr. Perry sent seedling forms of *Hemerocallis fulva*, some of which showed larger perianth segments with clearer colouring than the species. His named forms include 'Sunset,' 'Sunkist,' 'Imperator,' 'Shekinah,' 'Viscountess Byng,' 'Margaret Perry' and 'E. A. Bowles.'

Eriogonum for identification.—A species of *Eriogonum* was referred to the Scientific Committee from Floral Committee B. It was submitted to Kew for identification.

Convolvulus arvensis from Herefordshire.—Miss E. Armitage sent from Dadnor, Ross, Herefordshire, a plant of *Convolvulus arvensis* possessing a 5-partite corolla and also more markedly hastate leaves than the usually occurring plant. A note of this plant has been published in the Journal of Botany, 1934.

FRUIT AND VEGETABLE COMMITTEE.—Mr. W. H. DIVERS, V.M.H., in the Chair, and four other members present.

No business was before the Committee on this occasion.

FLORAL COMMITTEE A.—Mr. J. M. BRIDGEFORD in the Chair, and twelve other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Phloxes.

To Messrs. Kelway, Langport, for Gladioli.

Silver Flora Medal.

To Messrs. Dobbie, Edinburgh, for Dahlias.

To Messrs. McGredy, Portadown, for Roses.

To Napsbury Mental Hospital (gr. Mr. W. J. Jennings), St. Albans, for Celosias.

To Messrs. Prichard, Christchurch, for herbaceous plants.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses.

To Messrs. Chaplin, Waltham Cross, for Roses.

To Mr. E. Ladhams, Elstead, for herbaceous plants.

To Messrs. Lowe, Beeston, for Roses.

To Messrs. Spencer, Hockley, for Dahlias.

Flora Medal.

To Mr. R. Murrell, Shepperton, for Roses.

To Suffolk Seed Stores, Woodbridge, for herbaceous plants.

To Messrs. Wheatcroft, Nottingham, for Roses.

Banksian Medal.

To Messrs. Bentall, Havering, for Roses.

To Mr. H. A. Brown, Chingford, for Fuchsias.

To Messrs. B. R. Cant, Colchester, for Roses.

To D. B. Crane, Esq., Highgate, for Violettas.

To Messrs. Daniels, Norwich, for Annuals.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Messrs. Gibson, Cranleigh, for Phloxes.

To Messrs. Hemsley, Crawley, for herbaceous plants.

To Messrs. Hillier, Winchester, for herbaceous plants.

To Mr. A. C. B. Ker, New Haw, Surrey, for Roses.

To Messrs. Laxton, Bedford, for Roses.

To Mr. E. B. Le Grice, North Walsham, for Roses.

To Mr. A. Miles, Bickley, for herbaceous plants.

To Messrs. Perry, Enfield, for Hemerocallis, etc.

Award of Merit.

To Rose 'Phyllis Burden' (votes 9 for, 1 against), from Messrs. B. R. Cant, Colchester. See p. 422.

Preliminary Commendation.

To Delphinium × 'Ruysii No. 1061' (*D. nudicaule* × *D. elatum*.) (Votes 8 for), from Messrs. Ruys, Dedemsvaart, Holland. Flowers pink with a white eye marked with light purple.

Selected for trial at Wisley.

Delphinium × 'Ruysii No. 1061,' from Messrs. Ruys, Dedemsvaart, Holland.

Gladiolus 'Golden Ground,' from Messrs. Kelway, Langport.

Poppy 'York,' from J. Raine, Esq., Fawkham.

Sidalcea 'Mrs. Barclay,' from Messrs. Forbes, Hawick.
Violetta 'Ideal,' from D. B. Crane, Esq., Highgate.

The awards recommended to *Oenotheras* on trial at Wisley were confirmed.
The following awards were recommended after trial at Wisley.

Award of Merit.

To *Dianthus Allwoodii* 'Daphne,' from Messrs. Allwood, Haywards Heath.
To *Catananche coerulea* 'Perry's White,' from Messrs. Perry, Enfield.

Highly Commended.

To *Dianthus alpinus* 'Mars,' from Messrs. Allwood, Haywards Heath.

Other Exhibits.

Messrs. Chaplin, Waltham Cross : Rose 'Theresa.'
Mr. G. S. Crouch, Wrotham : *Mimulus* 'Annie Crouch.'
Mr. W. A. Collier, Redbourn : herbaceous plants.
Misses Hopkins, Coulsdon : herbaceous plants.
Mr. Gavin Jones, Letchworth : herbaceous plants.
Messrs. Letts, Hadleigh : Scabious and Roses.
Messrs. Prichard, Christchurch : *Kniphofia* 'W. Reeves.'
J. W. Robinson, Esq., Scarborough : *Chrysanthemum maximum* 'Jubilee 1935.'
Mr. L. Stassen, junior, Hillegom, Holland : Roses 'Stassen's Triumph' and 'Mevrouw May Stassen.'
Messrs. Wakeley, London : *Gladioli*.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended :—

Flora Medal.

To Mr. W. A. Constable, Southborough, for Lilies.
To Messrs. Russell, Richmond, for *Nymphaeas*.
To Messrs. Russell, Richmond, for greenhouse plants.

Banksian Medal.

To Mr. L. Lawrence, Taplow, for succulents.
To Mr. J. Robinson, Eltham, for rock plants.
To Messrs. R. Wallace, Tunbridge Wells, for Lilies.
To Messrs. T. Yano, Portman Square, W. 1, for dwarf trees.

Award of Merit.

To *Castanopsis chrysophylla* as a hardy evergreen tree (votes 12 for, 1 against), from Mr. R. C. Notcutt, Woodbridge. See p. 418.

To *Dierama pulcherrimum* 'Port Wine' as a hardy flowering plant (votes unanimous), from Viscountess Byng of Vimy, Thorpe-le-Soken. See p. 420.

To *Gazania pinnata* var. *scabra* as a tender flowering plant (votes unanimous), from Messrs. Sutton, Reading. See p. 420.

To *Nymphaea zanzibariensis* Kew form, as an aquatic flowering plant for the tropical house (votes unanimous), from the Director, Royal Botanic Gardens, Kew. See p. 421.

To *Pentstemon ambiguus* as a hardy flowering plant (votes unanimous), from Messrs. Sutton, Reading. See p. 421.

To *Teucrium orientale* as a hardy flowering plant (votes 12 for), from Messrs. Kelway, Langport. See p. 422.

Preliminary Commendation.

To *Polygala virgata* as a tender flowering shrub (votes unanimous), from Viscountess Byng of Vimy, Thorpe-le-Soken.

Cultural Commendation.

To Frank Barker, Esq., Onosma, Stevenage, for a pan of *Campanula isophylla* Mayi.

Other Exhibits.

T. T. Barnard, Esq., Wareham : *Watsonia Versfeldii* var. *alba*.

Viscountess Byng of Vimy, Thorpe-le-Soken : *Digitalis ferruginea*, *Eriogonum nutans*.

Messrs. Elliott, Stevenage : *Lallemantia canescens*.

Dr. P. L. Giuseppi, Felixstowe : *Artemisia discolor*.

Dame Alice Godman, D.B.E., Horsham : *Campanula* sp.

Mr. Amos Perry, Enfield : *Gypsophila paniculata* 'Rosenschleier.'

Messrs. Prichard, Christchurch : *Campanulas*.

Messrs. Wallace, Tunbridge Wells : *Lilium* × *princeps* 'G. C. Creelman.'

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and nine other members present.

Exhibits.

To Messrs. Stuart Low, Jarvis Brook, a group.

Sir Jeremiah Colman, Bt., Gatton Park, Surrey; *Cypripedium* × 'A. de Lairese' (*Curtisii* × *Rothschildianum*).

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and seven other members present.

Exhibit.

Mr. A. J. Cobb, Reading: Min. Dec. Dahlia 'Princeton.'

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Mr. J. M. BRIDGEFORD in the Chair, and five other members present.

Exhibit.

M. Jewell, Esq., Penavean, Crackington Haven, Bude, Cornwall: Carnation 'Mary Jewell.'

TRIAL OF BANDING GREASES, 1934-5.

Twelve Banding Greases were submitted for trial during September 1934. They were all applied on the same day—October 10, 1934—using the same grease-proof paper throughout the trial. Three standard fruit trees (including two Apples and one Pear) were used to each material. The greases were applied between 10.30 A.M. and 1 P.M.—the weather being calm and sunny, a mean temperature of 40° F. The bands were examined every week until April 12, 1935, all leaves which adhered being removed during October and November. The greases were applied by means of large wooden labels, each preparation having its own label. The number of wingless female Winter and other Moths captured on any one band forms no criterion as to the effectiveness of a particular grease, for the number varies with each tree.

An efficient banding grease is :

- (1) Easy of application.
- (2) Not unduly affected by weather, *e.g.* :
 - (a) Frost (which tends to harden the surface).
 - (b) Drying winds (which may dry the surface).
 - (c) High humidity (which may cause a film of water to form on the surface).
 - (d) Warm weather (which may cause the preparation to run).
- (3) Persistent in "tackiness" for at least six months.
- (4) Economical in use.
- (5) Reasonable in price.

Judged by these criteria the following awards were made :

Award of Merit.

Orbite, sent by Messrs. Kay Bros., Ltd., Stockport.

Little's Banding Grease, sent by Messrs. Morris, Little & Son, Ltd., 150 Southampton Row, W.C.1.

"Page" Tree-banding Grease, sent by Messrs. C. Page & Co., Ltd., 52 Grosvenor Gardens, S.W. 1.

Highly Commended.

Ready Spread Grease Bands, sent by Messrs. Corry & Co., Bedford Chambers, Covent Garden, W.C. 2.

Premex Tree-banding Grease, sent by Messrs. Premex Products, 20 Harp Lane, E.C. 3.

Commended.

Takco, sent by Messrs. Craven & Co., Ltd., of 48 and 50 Port Street, Evesham.

SPRAYING SYRINGES AND MACHINES.

A trial of various spraying apparatus took place at Wisley in July 1935, and the following awards were made.

The number in parentheses following the heading indicating each type of apparatus shows the number of separate entries in that group.

(A) *Syringes* (10).*Award of Merit.*

Abol Syringe, No. 5, from Messrs. Abol, Ltd., Beltring, Paddock Wood, Kent.

Four Oaks Spraying Syringe, No. 9, from The Four Oaks Spraying Machine Co., Four Oaks Works, Sutton Coldfield, near Birmingham.

Florist Friend Spraying Syringe, No. 7, from Messrs. W. T. French & Son, "Mysto" Works, Browning Street, Ladywood, Birmingham, 16.

(B) *Double-action Syringes* (9).*Award of Merit.*

Eclipse No. 1 Sprayer, from The Eclipse Spraying Co., Ltd., Rawlings Road, Bearwood, Smethwick, Staffs.

Four Oaks "Excelsior," from The Four Oaks Spraying Machine Co.

"Solo" Sprayer, from Messrs. T. Denston & Son, Masshouse Lane, Birmingham, 5.

"Solo" Sprayer, from The F.N.P. Manufacturing Co., Ltd., 90 Gracechurch Street, E.C. 3.

(C) *Bucket Sprayers* (17).*Award of Merit.*

Four Oaks "Belwell" Undentable Pump, from The Four Oaks Spraying Machine Co.

Highly Commended.

"Hyject" Standard Model Foot Pump, from Messrs. Benton & Stone, Bracebridge Street, Birmingham, 6.

(D) *Hand-worked Knapsack Sprayers* (5).

Award of Merit.

Four Oaks "External" Pattern, No. 102, from The Four Oaks Spraying Machine Co.

Highly Commended.

The "Eclair" Brass Alloy Knapsack Sprayer, from Messrs. Cooper, Pegler & Co., Ltd., 24-26 Christopher Street, Finsbury Square, E.C. 2.

(E) *Small Pneumatic Sprayers, Hand* (12).

Highly Commended.

Four Oaks "Maney" Sprayer, from The Four Oaks Spraying Machine Co.

(F) *Pneumatic Sprayers, Knapsack* (11).

Award of Merit.

Four Oaks "Kent" Pattern, from The Four Oaks Spraying Machine Co.

Highly Commended.

Pneumatic Knapsack Sprayer, No. 8, from Messrs. W. T. French & Son, Browning Street, Ladywood, Birmingham.

Holder-Harriden Type "AB," from Messrs. Holder-Harriden, Ltd., 6 Finsbury Square, E.C. 2.

(G) *Barrel and Tank Sprayers* (13).

(a) *Large.*

Award of Merit.

The "Ondine" Wheeled Pneumatic Sprayer, from Messrs. Cooper, Pegler & Co.

Highly Commended.

Four Oaks "Battle" Pattern, from The Four Oaks Spraying Machine Co.

Commended.

Four Oaks "Bridgwater" Pattern, from The Four Oaks Spraying Machine Co.

(b) *Small.*

Highly Commended.

Four Oaks "Conqueror" Pattern, from The Four Oaks Spraying Machine Co.

Holder-Harriden "New Kombinator," from Messrs. Holder-Harriden, Ltd.

Commended.

Four Oaks "Handy" Pattern, from The Four Oaks Spraying Machine Co.

(H) *Headland Pumps* (3).

Award of Merit.

"Craven Headland" Pump, from Messrs. W. J. Craven & Co., 48 and 50 Port Street, Evesham.

Highly Commended.

"Dual" High-pressure Sprayer, from Messrs. Cooper, Pegler & Co.

Commended.

Four Oaks "Vesey" Spraying Outfit, from The Four Oaks Spraying Machine Co.

(I) *Power Sprayers* (8).

Award of Merit.

Auto Culto and High-pressure Sprayer, from Messrs. Allen & Simmonds (1925), Ltd., 42 De Montford Road, Reading.

"Edwinson," 100/2 Standard Mobile Spraying Machine, from Messrs. Swinson's Engineering Works, Ltd., 57-59 Great Patrick Street, Belfast.

"Edwinson," 100/4 Standard Mobile Spraying Machine, from Messrs. Swinson's Engineering Works, Ltd.

Highly Commended.

"Hydraulux" Three-Ram Pump, from Messrs. W. J. Craven & Co.

Commended.

"Hydraulux" Two-Ram Pump on litter carrier, from Messrs. W. J. Craven & Co.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

SUBSCRIPTIONS.

Fellows are reminded that their friends joining the Society after October 1, and before January 1, 1936, are required to pay only one year's subscription, which entitles them to all the privileges of Fellowship until January 1, 1937. Back numbers of the JOURNAL may be obtained by Fellows at a cost of 9d. a number.

FRUIT FOR NAMING.

At this time of the year there is always a large amount of fruit sent to the Committee for naming, and Fellows are reminded of the following instructions which, if adhered to, will materially assist the Committee in their task of identification, and thus save Fellows from being disappointed owing to the Committee being unable to identify the fruit from the samples sent.

"Send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented-soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how they are grown, *e.g.* indoors or out, as cordons, bushes, or standards, etc."

THE LINDLEY LIBRARY.

Fellows have the privilege of borrowing certain books from the Lindley Library, and the regulations under which this is possible are as follows:

(1) The Library is open daily (Sundays and holidays excepted) from 10 A.M. to 5 P.M. (Saturdays 10 A.M. to 1 P.M.). On two-day Shows at Westminster it is open until 6 o'clock on the first day of the Show.

(2) The right of closing the Library at any time for purposes of rearrangement, cleaning, etc., is reserved. It will be closed annually between the second and third fortnightly meetings of the Society in July, in order that the books may be cleaned and the stock inspected. For this purpose it is absolutely necessary that all books borrowed be returned on or before July 16. During the two weeks which follow Fellows will be able to consult books but not to borrow them.

(3) Fellows of the Society have access to the Library at all times when it is open.

(4) Gardeners and others, not Fellows or Officers of the Society, must make application to the Secretary for permission to use the Library, and must enter their names and addresses in a book provided for that purpose.

(5) Anyone requiring the loan of a book to be taken from the Library must make written application to the Secretary, and loans will be granted on the following conditions, viz:

(a) That the borrower be personally known to one or more of the Officers of the Society, or produce satisfactory references.

c| PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

- (b) That the borrower sign a receipt for the volumes in a book provided for the purpose before removing them from the premises or, if unable to attend, acknowledge the receipt by post; and undertake to restore the books in good condition and to comply with the regulations.
- (c) That not more than three volumes be lent to one person at one time.
- (d) That borrowers through the post pay the postage both ways.
- (6) A certain discretion will be used as to what books shall be lent, but rare books which it would be difficult to replace, periodicals, expensive illustrated works, and works of reference which are likely to be in frequent requisition within the Library itself, may not be removed from the premises.
- (7) No books may be sent to Fellows resident abroad.
- (8) All books borrowed must be returned to the Library in good condition within one calendar month from the date of issue, and if sent by post must be properly protected and packed, but an extension of time may be granted on application.
- (9) The Secretary is empowered to demand of the borrowers such books as are detained beyond the prescribed time, and to take such steps as may be necessary to secure the prompt return of the same.
- (10) The loss of any book or any damage must be made good by the borrower.
- (11) Fellows requiring books on loan from the "Outlier" Libraries should make written application either to the Secretary of the Society or to the National Central Library for Students, Malet Street, London, W.C. 1.
- (12) The Trustees reserve the right of repealing or altering any of these regulations from time to time as may be required.

CONFERENCE ON ALPINE PLANTS.

The preliminary programme for a Conference on Alpine Plants, to be held in May 1936, is now settled.

The Conference will be spread over three days. The first afternoon, May 5, is to be devoted to two subjects: "Rock-Gardening of Different Periods in Different Countries" and "The Rise of Modern Rock Gardening and its Future." The subjects on May 6 will be "Utilization of Natural Slopes," "Utilization of Flat Sites," "Cultivation of Rock Plants in General," and "Cultivation of Difficult Plants." On May 7 discussions will take place on "The Alpine House" and "Propagation."

All Fellows interested in this Conference are asked to notify the Secretary.

CALENDAR.

October 1.—Entries for the Fruit and Vegetable Show to be held on the 8th close.

October 2 and 3.—Practical examination for the British Floral Art Diploma. In the afternoon of October 3 at 2.30 the work of the candidates will be on view.

October 8, 1-7.30 P.M., and October 9, 10 A.M. to 4 P.M.—The Fruit and Vegetable Show will be held in both the New and Old Halls. This is a competitive Show for the amateur gardener, together with non-competitive trade exhibits. Schedules for the Show are obtainable on application to the Secretary.

Four Challenge Cups are to be competed for at this Fruit and Vegetable Show:

- (1) The George Monro Memorial Cup, which is offered for the best exhibit of Grapes shown by an amateur.
- (2) The Gordon-Lennox Cup, for the most meritorious display of fruit staged by an amateur in the competitive classes.
- (3) The Affiliated Societies' Cup for Fruits, awarded for the best exhibit of fruits staged by an Affiliated Society in Class 94.
- (4) The Society's Vegetable Challenge Cup, which is offered for award to the competitor who secures the greatest number of prize-points in the classes for vegetables.

The following cups are offered for award outright:

- (1) The Riddell Trophy, which is offered for award in the class for a table of vegetables.
- (2) The Sutton Vegetable Cup, which is offered for the best exhibit of twelve distinct kinds shown by an amateur.

For fuller particulars with regard to these cups, please see the Schedule.

In the afternoon of October 8 at 3.30, in the Lecture Room of the New Hall, Mr. G. FOX-WILSON will lecture on "Fruit Pests: their Effect and

Detection," and there will be a special exhibit from Wisley on view at the Show entitled "Pests and Diseases of Fruit and Vegetables."

October 15, 1-7.30 P.M., and October 16, 10 A.M. to 4 P.M.—Fortnightly Meeting. At this Show may be seen the last of the herbaceous flowers; Orchids will be coming again into prominence, and should the weather conditions be favourable, many beautiful shrubs will be on show.

A Challenge Cup, offered for the best group of Orchids exhibited in a space not exceeding 60 square feet by an amateur who employs not more than three assistants in the Orchid houses (including the head gardener), will be competed for on this occasion. Entries should be received by the Secretary not later than October 9 on special entry forms, which may be had on application.

Two Orchid Trophies will also be competed for. These are presented by Orchid Traders. One is awarded for the best twelve Orchids, not more than two of any one genus, exhibited by an amateur who employs not more than two growers, including the head gardener, in his Orchid houses. The other for the best six Orchids exhibited by an amateur who employs not more than one Orchid grower or gardener. Entry forms may be had on application to the Secretary, and should be sent in not later than October 9.

At 3.30 P.M. on October 15, in the Lecture Room of the New Hall, Mr. E. L. HILLIER, junior, will lecture on "Some Outstanding New and Little-known Trees and Shrubs." This will be well illustrated by lantern slides, and it should be of great practical use to Fellows thinking of autumn planting.

In the Restaurant of the Old Hall at 4.30 P.M. the Lily Group will meet to discuss "Planting of Lilies."

October 15, 16 and 17.—Special Exhibition of Paintings and Drawings of Plants, Flowers and Gardens. Fellows interested in this exhibition are requested to apply to the Secretary. (See also special paragraph below.)

NOTE.—In the R.H.S. Gardeners' Diary the date of this Show was given for October 22 and 23. This was corrected subsequently on an erratum slip issued with the Diary.

November 5, 1-5 P.M.—Fortnightly Meeting. From now onwards displays will mainly be of stove and greenhouse plants and flowers, and Orchids, Carnations and Chrysanthemums will be attractive features of this Show. There will also be exhibits of pictures, photographs and plans.

In the afternoon at 3.30, in the Lecture Room, the first of the Masters Memorial Lectures will be given on "Problems connected with the Classification of Plants," by Sir WILLIAM WRIGHT SMITH.

November 6, 1-7.30 P.M., and November 7, 10 A.M. to 5 P.M.—National Chrysanthemum Society's Show.

November 6 and 7, 2-4 P.M. (weather permitting).—Practical Demonstration at Wisley on "Planting Fruit Trees and Roses." Fellows wishing to attend this demonstration should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning which day they propose to attend.

November 19, 1-7.30 P.M., and November 20, 10 A.M. to 5 P.M.—British Carnation Society's Show in the Old Hall.

November 26, 1-5 P.M.—Fortnightly Meeting. At 3.30 P.M. in the Lecture Room of the New Hall Sir WILLIAM WRIGHT SMITH will give the second of the Masters Memorial Lectures on "Problems connected with the Classification of Plants."

EXHIBITION OF PAINTINGS AND DRAWINGS OF PLANTS, FLOWERS AND GARDENS.

(Photographs, plans and models excluded.)

A special exhibition of paintings and drawings of plants, flowers and gardens will be held in the Old Hall on October 15, 16 and 17.

According to preliminary arrangements, October 3 will be the latest date for the receipt of entries, and on October 9 the office will be open for the reception of exhibits. On Thursday and Friday, October 10 and 11, the Hanging Committee will sit, and on Monday, October 14, the exhibition will be open for a Press View. On Tuesday, Wednesday and Thursday, October 15, 16 and 17, the exhibition will be open to the Fellows and general public.

All Fellows interested in this Show are asked to write to the Secretary for full particulars with regard to the regulations governing exhibition.

HALL LETTINGS.

The Society's New Hall has been let from October 21 to 25 for the Medical Exhibition, particulars of which may be obtained from "The British and Colonial Druggists, Ltd," 194-200 Bishopsgate, E.C. 2.

From October 26 to November 2 the Old Hall has been let for a Lightweight Cycling Exhibition, the organizer of which is J. E. HOLDSWORTH, Esq., 99 Lennard Road, Beckenham, Kent.

On November 6 the Missions Sale of Work will be held in the Old Hall, and it will also be open on the 7th.

Attention has already been drawn to the Women's Institutes Exhibition which is to be held in our New Hall from November 13 to 20, and those interested and wishing for full particulars are asked to write to The National Federation of Women's Institutes, 39 Eccleston Street, S.W. 1.

In the New Hall, from November 29 to December 6, there is to be a Health and Beauty Exhibition.

WISLEY IN OCTOBER.

The advance of autumn brings gradual decrease in the floral display, and for the continuation of colour in the garden the Dahlia and Aster (Michaelmas Daisy) are those genera to which we are most indebted.

In the Dahlia Trials at Wisley, where two long borders are devoted to their cultivation, a large number of varieties representing the different groups under which they are placed are included, the varieties grown being considered to be the most meritorious of the Pompon, Cactus, Decorative, Pæony-flowered, Star and other types, with new varieties for judging.

Michaelmas Daisies on trial will be found near the Dahlia Borders, and these also are represented well in various classes ranging in height from the dwarf of a foot or so in height in such varieties as 'Nancy,' and 'Marjorie,' through the slightly taller forms of *Aster Amellus* to the numerous forms of the *Novi-belgi* and *Novae-angliae* types.

During the earlier part of the month *Gentiana sino-ornata* should be at its best and several plantings of this late species will be found in the garden, while in the rock garden *G. Veitchorum* may be seen. Possibly the latest of the *Colchicums* will still be in flower. They occupy a bed near the trial of Bearded Irises as well as several parts of the Wild Garden, where they are growing in considerable quantities and variety.

The autumn-flowering *Crocus nudiflorus* and *C. speciosus* give a good display near the Rock Garden, while under the trees in the Wild Garden there should still be flowers of the hardy autumn-flowering *Cyclamen* covering the banks under the trees.

Although September is perhaps the month in which to see the Heather Garden at its best, still many colour varieties of both *Calluna* and *Erica* remain to make this part of Seven Acres attractive.

Many trees and shrubs which brighten the garden with their autumn-coloured foliage will now be at their best in the many tints of red and yellow.

Owing to the damage to the flowers of trees and shrubs during their time of flowering in mid-May the quantities of fruit usually looked for at this season is smaller than usual; but notwithstanding this many *Roses*, *Berberis*, *Pyracanthas*, *Skimmias*, *Gaultherias*, and others have escaped, to brighten the garden.

Those interested in rare shrubs should endeavour to see the specimen of *Schima argentea* in flower growing near the space allotted to plants which have secured the Award of Garden Merit.

On the Herbaceous Borders only late-flowering plants such as *Helianthus*, *Rudbeckia*, *Solidago* and *Anemone japonica* and its varieties, will still retain their attractiveness among the collection.

To mention only a few of the plants in the Greenhouses the following may be of interest: *Nerine* species and hybrids, *Calceolaria Pavonii*, *Statice rosea*, *Fuchsia* species and hybrids, *Cestrum aurantiacum*, *Tibouchina semidecandra*, *Acacias*, *Macleania punctata* and *Leonotis Leonurus* are outstanding examples of late-flowering plants.

GENERAL MEETINGS.

AUGUST 13, 1935.

A lecture on "The Flowers of the Little Karroo" was given by the Hon. Mrs. Ryder. See p. 429.

Chairman, Mr. F. C. STERN, F.C.S.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and five other members present.

Eriogonum, etc.—Mr. Cotton reported that the *Eriogonum* shown by Viscountess Byng proved to be *E. nutans*, and the *Gentiana* from Wisley, *G. cruciata*.

Conservation of Phosphates, etc.—Professor Armstrong referred to the importance of devising means of conserving the nitrogen and phosphates which are sent down in sewage to the sea and lost thereby. He expressed the desirability of instituting experiments to ascertain whether water plants would not take up these substances in considerable quantities from sewage water, and on suitable treatment return them with humus to the soil. The problem appears never to have been thoroughly investigated and to be one not difficult of solution.

Plants for naming.—Several plants were dealt with, and a *Lonicera* and *Watsonia*, referred to the Committee from Floral Committee B, were taken to Kew by Mr. Cotton.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and five other members present.

Exhibit.

Mr. A. Dawkins, Chelsea: Melon 'The Gem.'

FLORAL COMMITTEE A.—Mr. J. M. BRIDGEFORD in the Chair, and ten other members present.

Awards Recommended:—*Silver-gilt Banksian Medal.*

To Mr. S. Ogg, Swanley, for Dahlias.

Silver Floral Medal.

To Messrs. Lowe, Beeston, for Roses.

To Messrs. Prichard, Christchurch, for herbaceous plants.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Mr. J. F. Cumming, Wisbech, for Scabious.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. E. Ladhams, Elstead, for herbaceous plants.

To Messrs. Prior, Colchester, for Roses.

To Messrs. Spencer, Hockley, for Dahlias.

To Messrs. Stewart, Wimborne, for herbaceous plants.

Flora Medal.

To Messrs. B. R. Cant, Colchester, for Roses.

Banksian Medal.

To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses.

To Messrs. Bentall, Havering, for Roses.

To Mr. H. A. Brown, South Chingford, for Fuchsias.

To Mr. A. Miles, Bickley, for herbaceous plants.

To Messrs. Proctor, Chesterfield, for Roses.

Selected for trial at Wisley.

Gypsophila unnamed, from Messrs. Baker, Codsall.

Gypsophila paniculata var., from Messrs. Perry, Enfield.

Venidium 'Art Shades,' from Messrs. Sutton, Reading.

The awards recommended to Gladioli on trial at Wisley were confirmed.

The following award was recommended after trial at Wisley.

Award of Merit.

To *Heliotrope* 'Sudeley Purple Emperor,' from Mrs. Dent Brocklehurst, Winchcombe.

Other Exhibits.

Messrs. A. Perry, Enfield : *Linum narbonense* 'June Perfield,' *Verbena venosa lilacina*.

Messrs. Wheatcroft, Gedling : Roses.

Mr. R. Colpoys Wood, West Drayton : herbaceous plants.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Neale, Newhaven, for succulents.

To Messrs. Perry, Enfield, for hardy aquatic plants.

Flora Medal.

To Messrs. Russell, Richmond, for Nymphacae and Clematis.

Award of Merit.

To *Lilium dauricum* var. *venustum* f. *Balemanniae* as a hardy flowering plant (votes unanimous), from the Knap Hill Nursery Co., Woking. See p. 463.

To *Nymphaea tetragona alba* as a hardy aquatic flowering plant (votes 10 for), from Messrs. Perry, Enfield. See p. 463.

To *Stokesia cyanea* var. *superba* as a hardy flowering plant (votes unanimous), from T. Hay, Esq., Hyde Park, W. 2. See p. 463.

Other Exhibits.

Viscountess Byng of Vimy, Thorpe-le-Soken : *Lonicera confusa*, *Watsonia Galpinii*.

T. Hay, Esq., Hyde Park : *Aquilegia Skinneri*.

Miss Hopkins, Coulsdon : rock plants.

Mr. L. Lawrence, Taplow : succulents.

Messrs. Perry, Enfield : *Nymphaea pygmaea helvola*.

Messrs. Sutton, Reading : *Limonium echinoides*.

P. M. Syngé, Esq., West Byfleet : *Hypoxis apiculata*.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and seven other members present.

Selected for trial at Wisley.

From Mr. J. F. Barwise, Burnley : 'Brun,' 'Jeannie,' 'Queen Gladys.'

From Messrs. Stredwick, St. Leonards-on-Sea : 'Golden Glory' (Cactus), 'Lucius' (Small Dec.), 'Michael Steele' (Large Dec.), 'Rev. Morton' (Large Dec.), 'Silverhill Gem' (Semi Cactus), 'Viola' (Cactus), 'Vulcan' (Cactus).

AUGUST 27, 1935.

SEWELL MEDAL COMPETITION.

The *Sewell Medal* for the best exhibit of six pots or pans of plants suitable for the rock garden or alpine house shown by an amateur was awarded to Mark Fenwick, Esq., J.P., Abbottswood, Stow-on-the-Wold.

A lecture was given by Mr. Ben Wells, jun., on "New Herbaceous Plants." Chairman, Dr. Fred Stoker, F.L.S.

SCIENTIFIC COMMITTEE.—Mr. W. HALES, A.L.S., in the Chair, and three other members present.

Rare Oaks.—Mr. A. B. Jackson showed branches of Oaks as follows : *Quercus semecarpifolia* from the late Mr. Gamble's garden, *Quercus stenophylla*, allied to *Q. glauca* with which it has been confused, *Q. edulis*, a Japanese species, and *Q. macedonica*, all from Tortworth, Gloucestershire.

Juniperus phoeniceus.—He also showed a specimen of the uncommon *J. phoeniceus* in fruit.

Plants to be named.—Mr. Cotton reported that the *Lonicera* from Lady Byng's garden referred to Kew proved to be *L. confusa* and the *Watsonia* from the same source *W. Galpinii*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and four other members present.

Exhibits.

Mr. J. C. Beck, Henley-on-Thames : seedling Peach.

Mr. W. Fifield, Faversham : Peach 'Rochester.'

Commercial Fruit Trials, Wisley : Plum 'Delicious,' Blackberry 'Bedford Giant.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Delphiniums.

To Messrs. Brown & Such, Maidenhead, for Dahlias.

To Messrs. Prior, Colchester, for Roses.

To Messrs. Redgrove & Patrick, Sevenoaks, for Roses, Dahlias and Gladiolus.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations and Pinks.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. Engelmann, Saffron Walden, for Carnations.

Banksian Medal.

To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses

To Messrs. Bentall, Havering, for Roses.

To Messrs. Hemsley, Crawley, for Dahlias.

To Messrs. Kelway, Langport, for Gladioli.

To Mr. E. Ladhams, Elstead, for herbaceous plants.

Award of Merit.

To Chrysanthemum 'Hollybank Bronze' for cutting and market (votes 7 for), from Messrs. Hussey, St. Leonards.

To Chrysanthemum 'Pink Precoce' for cutting and market (votes 7 for, 2 against), from Mr. T. Stevenson, Hillingdon.

To Chrysanthemum 'Salmon Precoce' for cutting and market (votes unanimous), from Mr. T. Stevenson, Hillingdon.

Selected for trial at Wisley.

Catananche coerulea major, from Messrs. A. Perry, Enfield.

Echinacea 'Dover Star', from Messrs. Clark, Dover

Fuchsia 'Tom Thumb', from Messrs. Redgrove & Patrick, Sevenoaks.

Phytostegia virginica intermedia rubra, from Messrs. A. Perry, Enfield.

Venidium astuosum hybrids, from Messrs. Unwin, Histon.

Other Exhibits.

Messrs. Blackmore & Langdon, Bath : Phlox.

Mr H. A. Brown, South Chingford : Fuchsias.

Messrs. Clark, Dover : *Eremurus*, *Gaillardia*, 'Dover Dawn.'

Miss A. Dillon, Charlbury : *Lobelia fulgens* 'Mrs. Furnell.'

H. R. Gibbons, Esq., Coventry : *Pelargoniums*.

Canon E. W. J. Helling, Marnhull : seedling *Gladiolus*.

Messrs. Hussey, St. Leonards : *Chrysanthemum* 'Sussex Beauty.'

Messrs. Perry, Enfield : herbaceous plants.

Messrs. Wheatcroft, Nottingham : *Roses*.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fourteen other members present

Awards Recommended :—

Floral Medal.

To Messrs. Russell, Richmond, for *Nymphaeas* and *Clematis*.

Banksian Medal.

To Messrs. Prichard, Christchurch, for rock garden plants.

Award of Merit.

To *Calluna vulgaris* 'J. H. Hamilton' as a hardy flowering shrub (votes 12 for), from Messrs. Maxwell & Beale, Broadstone. See p. 463.

To *Eremurus Aitchisonii* as a hardy flowering plant (votes 6 for), from Messrs. Clark, Dover. See p. 463.

To *Gentiana Pneumonanthe* var. *depressa* as a hardy flowering plant for the rock garden (votes 9 for), from T. Hay, Esq., Hyde Park, London. See p. 463.

To *Rudbeckia maxima* as a hardy flowering plant (votes unanimous), from the Director, R.H.S. Gardens, Wisley. See p. 463.

To *Scabiosa Fischeri* as a hardy flowering plant (votes 8 for), from T. Hay, Esq., Hyde Park, London. See p. 463.

Other Exhibits.

W. Bentley, Esq., Newbury : *Rudbeckia triloba*.

Viscountess Byng of Vimy, Thorpe-le-Soken : *Tricuspidaria lanceolata* in fruit.

T. Hay, Esq., Hyde Park : *Liatris pycnostachya*.

Miss Hopkins, Coulsdon : hardy plants.

Messrs. Stuart Low, Enfield : *Allamanda* 'Gold Crest.'

Mr. Amos Perry, Enfield: *Asphodelus ramosus microcarpus*, *Liatris pycnostachya*.

Viscountess St. Cyres, Lymington: *Dianella tasmanica*, *Abutilon megapotamicum*.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and six other members present.

Selected for trial at Wisley.

From Messrs. Stredwick, St. Leonards-on-Sea: 'Blazer' (Small Dec.), 'Bountiful' (Small Dec.), 'Gordon King' (Small Dec.), 'Hilda Hoad' (Small Dec.), 'Lady Clive Wigram' (Large Dec.), 'Miss Plowman' (Small Dec.), 'Molly' (Pompon), 'Mrs. Chandler' (Cactus).

From Mr. J. T. West, Brentwood: 'Florence McAllister' (Garden Cactus).

Dahlias were also submitted by G. F. Drayson, Esq., Buckhurst Hill; G. Moore, Esq., Leicester; J. S. Wallis, Esq., Histon.

SEPTEMBER 3, 1935.

JOINT DAHLIA COMMITTEE (at the Dahlia Society's Show).—Mr. D. B. CRANE in the Chair, and eight other members present.

Selected for trial at Wisley.

From Messrs. Bruidegom, Baarn, Holland: 'Dulcinea' (Semi Cactus), 'Flaming Torch' (Semi Cactus).

From Messrs. Carlée, Haarlem, Holland: 'Anneke' (Dec.), 'Chancellor' (Single).

From Messrs. Cheal, Crawley: 'Beryl' (Small Dec.), 'Odin' (Small Pæony).

From Messrs. Dobbie, Edinburgh: 'Christine' (Informal Dec.).

From Miss C. I. Marshall, Hythe: 'Yellow Ball.'

From Mr. J. B. Riding, Chingford: 'Mrs. F. Morgan,' 'Verschaeve.'

From G. P. Roddam, Esq. (gr. Mr. A. J. Taylor), Tunbridge Wells: 'Sandhurst Pride' (Med. Dec.).

From Messrs. Rutter, Heswall: 'Salmon Glorious.'

From Messrs. Stredwick, St. Leonards-on-Sea: 'Mrs. Robins.'

From Messrs. Torrance & Hopkins, Glasgow: 'Brilliancy' (Semi Cactus), 'Robert Davidson' (Semi Cactus).

From Messrs. Treseder, Cardiff: 'Hida' (Charm), 'Sue' (Min. Cactus).

From Mr. J. T. West, Brentwood: 'Dearie,' 'Little King,' 'Little Spitfire' (Pompon), 'Royalty' (Pompon).

Dahlias were also submitted by Mr. F. J. Barwise, Burnley; Mr. A. Brown, Leagrave; Messrs. Brown & Such, Maidenhead; Mr. G. W. Clark, Walton-on-Thames; Mr. P. Dekker, Niedorp, Holland; Rev. J. F. Douglas, Sachleford; Mr. G. Elsom, Spalding; A. E. Goodbody, Esq., Stoke d'Abernon; A. Griffiths, Esq., London; Messrs. Hornsveld, Baarn, Holland; Messrs. Carter Page, London; Mrs. Solly-Flood, Thomastown, Ireland; Messrs. Topsvoort, Aalsmeer, Holland; Mr. J. S. Wallis, Histon; Mr. H. Woolman, Birmingham.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

AUTUMN SHOW.

The Society's Great Autumn Show was successfully held in the National Hall of Olympia from Wednesday, September 25, to Friday, September 27. The attendance exceeded any previous attendance at an Autumn Show, and in spite of the disastrous weather that immediately preceded the Show the exhibits were in wonderful condition, and they were beautifully staged. There was a shortage of fruit, which was not to be wondered at after the late May frosts and more recent gales.

Some slight inconvenience was caused at the opening of the Show owing to the eagerness of Fellows to attend at the opening hour, but the pressure was soon relieved, and the circulation in the Hall itself was not uncomfortable.

It is very much to be regretted that the Society cannot get this accommodation for the Autumn Show next year, and that Fellows will be asked to forgo this special display.

The Awards given at this Show will be found on page clxiii, and Fellows are reminded that the Autumn Show Catalogue forms a good guide to horticultural firms, nurserymen and sundriesmen. Should anyone desire to have a copy, so long as any are available, it shall be sent free upon application.

On the first day of the Autumn Show the Council took the opportunity of entertaining the members of the many Committees, who so generously give up their time throughout the year to help the Society in carrying out its work.

SUBSCRIPTIONS.

Fellows are reminded that annual subscriptions are payable in advance on the first day of January in each year. Tickets are sent to Fellows only after the receipt of subscriptions, and Fellows cannot partake in the Plant Distribution unless their subscriptions have been paid. Fellows can at any time relieve themselves of any further trouble in the matter either by compounding their subscriptions by payment of a lump sum or by obtaining from the Secretary a Banker's Order to pay their subscription on January 1 each year.

CATALOGUES.

At this season of the year new catalogues for the coming season usually arrive. Fellows are reminded that the Society maintains in the Lindley Library a valuable collection of catalogues, not only of the past but also of the present. The Keeper of the Library would be grateful if Fellows, when turning over their accumulation of catalogues, would think of the Library and forward any that they do not want to the Secretary. Catalogues of the past are often useful in providing evidence of the introduction of a plant to horticulture, or of the date of the raising of a new variety.

CALENDAR.

November 5, 1-5 P.M.—Fortnightly Meeting. From now onwards, displays will mainly be of stove and greenhouse plants and flowers, and Orchids, Carnations and Chrysanthemums will be attractive features of this Show. There will also be exhibits of pictures, photographs and plans.

clviii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

In the afternoon at 3.30 in the Lecture Room, the first of the Masters Memorial Lectures will be given on "Problems connected with the Classification of Plants," by Sir WILLIAM WRIGHT SMITH.

November 6, 1-7.30 P.M., and November 7, 10 A.M.-5 P.M.—National Chrysanthemum Society's Show.

November 6 and 7, from 2-4 P.M. (weather permitting).—Practical Demonstration at Wisley on "Planting Fruit Trees and Roses." Fellows wishing to attend this Demonstration should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning which day they propose to attend.

November 19, 1-7.30 P.M., and November 20, 10 A.M.-5 P.M.—British Carnation Society's Show in the Old Hall.

November 26, 1-5 P.M.—Fortnightly Meeting and Show of Flowers in season. At 3.30 P.M. in the Lecture Room of the New Hall, Sir WILLIAM WRIGHT SMITH will give the second of the Masters Memorial Lectures on "Problems connected with the Classification of Plants."

December 4 and 5, from 2-4 P.M. (weather permitting).—Practical Demonstration at Wisley on "Pruning Fruit Trees." Fellows wishing to attend this Demonstration should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning which day they propose to attend.

December 10, 1-5 P.M.—Fortnightly Meeting and Show of Flowers in season. The last meeting of the year. At this Show there will be displayed certain horticultural sundries; and, as in the two previous fortnightly meetings, there will be exhibits of pictures, photographs and plans.

At 3.30 on Tuesday afternoon, December 10, in the Lecture Room, the Institute of Landscape Architects will hold its Annual Meeting.

WALNUTS.

In 1929 the Society held a special exhibition of Walnuts, with a view to finding the best varieties, and as a result of this exhibition certain varieties were chosen as the best, and these have since been propagated.

On November 5 this year, at the Fortnightly Meeting, the East Malling Research Station, who undertook the growing of these varieties, are staging a special exhibit to show the results obtained, and in this number of the JOURNAL (p. 501) a description of their work is given, which should be of great interest to all those who have been following the question of growing Walnuts in this country.

A leaflet was published after the exhibition in 1929, entitled "Walnuts," by H. Spence, M.I.Chem.E., and "Further Observations on Walnut Growing," by A. W. Witt, N.D.H., copies of which are still available, price 1s., post free.

HALL LETTINGS.

On November 6 and 7 the Missions Sale of Work will be held in the Old Hall.

In the New Hall, Our Dumb Friends' League is holding a Fair on November 13 and 14; while in the Old Hall during the week November 13 to 20 the Women's Institutes Exhibition will be held, and any Fellow interested in the work of the Women's Institutes is asked to write for particulars to the organizers, The National Federation of Women's Institutes, 39 Eccleston Street, S.W. 1.

From November 29 to December 6 there will be a Health and Beauty Exhibition in the New Hall, full particulars of which may be had on application to Mensana, Ltd., 10-12 Cork Street, W. 1.

On December 13 and 14 there will be a Bird and Aquatic Show. This is a rather unusual type of exhibition, and should further particulars be desired the organizers are The Marshall Press Ltd., Milford Lane, Strand, W.C. 2.

PICTURES, PLANS, PHOTOGRAPHS, ETC.

With the approach of winter, space will be available at the Fortnightly Shows for pictures and photographs of plants, flowers, gardens, and plans or models of gardens. Regulations with regard to these exhibits may be had on application to the Secretary. The dates of the Shows when these exhibits are permitted are November 5, November 26, December 10, 1935; January 14, January 28, February 11, and February 25, 1936.

HORTICULTURAL SUNDRIES.

The exhibition of Horticultural Sundries will be allowed on November 26, December 10, January 14, and January 28.

FRUIT FOR NAMING.

At this time of the year there is always a large amount of fruit sent to the Committee for naming, and Fellows are reminded of the following instructions, which, if adhered to, will materially assist the Committee in their task of identification, and thus save Fellows from being disappointed owing to the Committee being unable to identify the fruit from the samples sent :

" Send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how they are grown, *e.g.* indoors or out, as cordons, bushes or standards, etc."

PUBLICATIONS.

The " R.H.S. Gardeners' Diary " now appears for the twenty-fifth year, which vouches for its usefulness and popularity. In addition to the usual necessary information so important to all gardeners, space has been found for notes on Crocuses and Ornamental Grasses.

Copies may be obtained from the Secretary or any bookseller, price 2s. in cloth, 5s. in leather refillable case. Refills, 1s. 6d. Postage, 2d. a copy.

The Daffodil Year Book for 1935 is now published, price 5s. stiff covers, 6s. cloth.

The Lily Year Book for 1935 will be published in November.

" Cherries and Soft Fruits : Varieties and Cultivation in 1935 "—being the Report of the Conference recently held on Soft Fruits—in preparation and will also shortly be published.

SOME COMING EVENTS, 1936.

Annual Meeting : February 25.

Daffodil Show : April 16 and 17.

Alpine Conference and Show : May 5, 6 and 7.

The Chelsea Spring Flower Show : May 20, 21 and 22.

The Amateurs' Flower Show : June 30.

THE LINDLEY LIBRARY.

Fellows are reminded that the Lindley Library stands at their disposal, and their attention is drawn to the following regulations :

(1) The Library is open daily (Sundays and holidays excepted) from 10 A.M. to 5 P.M. (Saturdays, 10 A.M. to 1 P.M.). On two-day Shows at Westminster it is open until 6 o'clock on the first day of the Show.

(2) The right of closing the Library at any time for purposes of rearrangement, cleaning, etc., is reserved. It will be closed annually between the second and third fortnightly meetings of the Society in July, in order that the books may be cleaned and the stock inspected. For this purpose it is absolutely necessary that all books borrowed be returned on or before July 16. During the two weeks which follow Fellows will be able to consult books but not to borrow them.

(3) Fellows of the Society have access to the Library at all times when it is open.

(4) Gardeners and others, not Fellows or Officers of the Society, must make application to the Secretary for permission to use the Library, and must enter their names and addresses in a book provided for that purpose.

(5) Anyone requiring the loan of a book to be taken from the Library must make written application to the Secretary, and loans will be granted on the following conditions, *viz.* :

(a) That the borrower be personally known to one or more of the Officers of the Society, or produce satisfactory references.

- (b) That the borrower sign a receipt for the volumes in a book provided for the purpose before removing them from the premises or, if unable to attend, acknowledge the receipt by post; and undertake to restore the books in good condition and to comply with the regulations.
- (c) That not more than three volumes be lent to one person at one time.
- (d) That borrowers through the post pay the postage both ways.
- (6) A certain discretion will be used as to what books shall be lent, but rare books which it would be difficult to replace, periodicals, expensive illustrated works, and works of reference which are likely to be in frequent requisition within the Library itself, may not be removed from the premises.
- (7) No books may be sent to Fellows resident abroad.
- (8) All books borrowed must be returned to the Library in good condition within one calendar month from the date of issue, and if sent by post must be properly protected and packed, but an extension of time may be granted on application.
- (9) The Secretary is empowered to demand of the borrowers such books as are detained beyond the prescribed time, and to take such steps as may be necessary to secure the prompt return of the same.
- (10) The loss of any book or any damage must be made good by the borrower.
- (11) Fellows requiring books on loan from the "Outlier" Libraries should make written application either to the Secretary of the Society or to the National Central Library for Students, Malet Street, London, W.C. 1.
- (12) The Trustees reserve the right of repealing or altering any of these regulations from time to time as may be required.

WISLEY GARDENS.

A demonstration of the planting of Fruit Trees and Roses will be held on Wednesday and Thursday, November 6 and 7, if weather permits, between the hours of 2 and 4 P.M. Fellows and their friends attending these demonstrations should inform the Director a few days previously, saying which day they intend to come.

One of the principal attractions in the Gardens during November will be found in the display of fruit and autumn colour of the foliage of the large collection of Berberis species and hybrids in Seven Acres. Here also the Heath Garden will still show some colour with the russet tones of the fading flowers of some species, while the earliest varieties of *Erica carnea* will begin to give this part of the Gardens splashes of brighter colour as well.

Should the weather be favourable a large specimen of *Prunus subhirtella autumnalis*, growing near the Heather Garden, will be producing its earliest crop of semi-double pale pink flowers.

The scarlet fruits of the large variety of Cotoneasters from now on through the winter do much to brighten their surroundings by their brilliant colour, helped by the foliage. Other fruiting plants to be seen are Pernettya, Skimmia and Pyracantha. Around the ponds and elsewhere the coloured barks of the Willows and Cornus deserve attention. These with their various shades of red and yellow are in the sunshine very ornamental.

In the greenhouse much of interest will be found in winter flowering shrubs, such as Acacia, Cestrum, Erica, and other genera of greenhouse shrubs.

Nerines, Oxalis, Gerbera, Statice and other tender plants will make a visit to the Half-hardy House worth while.

GENERAL MEETINGS.

SEPTEMBER 10, 1935.

SCIENTIFIC COMMITTEE.—Mr. W. HALES, A.L.S., in the Chair, and six other members present.

Peculiar Water.—Dr. Voelcker remarked on the great peculiarities of a water received from Northam, where it is in public supply. The water is very rich in magnesium sulphate and in total solids, but is a soft water. He is making further inquiries regarding it.

Watsonia bulbifera.—Mr. Collingwood Ingram sent a spike of *Watsonia bulbifera* bearing numerous small corms in the axils of the floral bracts—a normal occurrence in this species.

Antirrhinum rust.—The rust of *Antirrhinums* is again prevalent in some districts this year, and Mr. Marsden-Jones reported that it had again attacked plants of the wild form of *Antirrhinum majus* growing at Potterne as it had done in 1933 (the 1933 plants having been burnt). *A. Orontium* had escaped infection in all years.

Illustrations of Cedars.—Mr. A. B. Jackson showed a print of a Cedar (now cut down) planted in the early part of the eighteenth century in the Chelsea Physic Garden, and of another very old one growing in the Palace Garden at Enfield.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and four other members present.

Exhibits.

Messrs. Laxton, Bedford: Blackberry 'Bedford Giant.'

Army Vocational Training Centre, Chisleton: Apples, Peaches, Grapes, Melons.

Commercial Fruit Trials, Wisley: Plum 'Marjorie's Seedling.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—*Silver-gilt Banksian Medal.*

To Mr. J. B. Riding, Chingford, for Dahlias.

Silver Flora Medal.

To Messrs. Cheal, Crawley, for Dahlias and Pentstemons.

To Messrs. Dobbie, Edinburgh, for Dahlias.

To Messrs. Carter Page, London, for Dahlias.

To Messrs. Wakeley, London, for Gladioli.

Silver Banksian Medal.

To Messrs. Brown & Such, Maidenhead, for Dahlias.

To Mr. E. Ladhams, Elstead, for herbaceous plants.

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.

To Mr. J. T. West, Brentwood, for Dahlias.

Flora Medal.

To Messrs. Kelway, Langport, for Gladioli.

To Messrs. Prichard, Christchurch, for herbaceous plants.

Banksian Medal.

To Messrs. Bentall, Havering, for Roses.

To Messrs. B. R. Cant, Colchester, for Roses.

To Mr. J. F. Cumming, Wisbech, for Scabious, etc.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Messrs. Spencer, Hockley, for Dahlias.

Award of Merit.

To Chrysanthemum 'Chastity' for cutting and market (votes unanimous), from Messrs. Johnson, Tibshelf. See p. 510.

To Chrysanthemum 'Clarion' for cutting and market (votes 12 for, 1 against), from Mr. E. Riley, Alfreton. See p. 510.

To Chrysanthemum 'Hollicot Supreme' for cutting and market (votes unanimous), from Mr. T. Stevenson, Hillingdon. See p. 510.

To Chrysanthemum 'Magnetic' for cutting and market (votes 9 for, 4 against), from Mr. E. Riley. See p. 510.

To Chrysanthemum 'Peveril' for cutting and market (votes unanimous), from Messrs. Johnson, Tibshelf. See p. 510.

To Chrysanthemum 'Velveteen' for cutting and market (votes unanimous), from Messrs. Johnson. See p. 511.

Selected for trial at Wisley.

Antirrhinum 'La Victoire,' from Messrs. W. H. Simpson, Birmingham.

Aster 'Supreme,' from Mr. T. Bones, Cheshunt.

Chrysanthemum 'Border White,' from Messrs. Johnson.

Chrysanthemum 'Jubilee Pink,' from Messrs. Buckwell, St. Mary Cray.

Chrysanthemum 'Mrs. A. A. Buckwell,' from Messrs. Buckwell.

Other Exhibits.

Messrs. Allwood, Haywards Heath : Carnations.

Messrs. Clark, Dover : herbaceous plants.

Major G. Churcher, Lindfield : Gladiolus 'La Argentina.'

Messrs. Kelway, Langport : Gladiolus 'Yellow Beauty.'

Mr. A. C. B. Ker, New Haw : Asters.

Mr. H. Shoesmith, Woking : Chrysanthemums 'Hussar' and 'Sheila.'

Messrs. W. H. Simpson, Birmingham : Antirrhinum 'Dorothy Silk.'

Viscountess Byng of Vimy, Thorpe-le-Soken : Marigolds 'Large Golden' and 'Lemon Yellow.'

Messrs. Wheatcroft, Gedling : Roses.

Messrs. Wordley & Sapsford, Pevensy : Chrysanthemum 'Auderida.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Neale, Newhaven, for succulents.

Flora Medal.

To Messrs. Russell, Richmond, for Clematis, Nymphaeas and shrubs.

Award of Merit.

To Clematis 'Blue Belle' as a hardy flowering climber (votes unanimous), from Mr. E. Markham, Gravetye, East Grinstead. See p. 511.

To Clematis 'Pourpre Mat' as a hardy flowering climber (votes 11 for), from Mr. E. Markham. See p. 511.

To Clematis 'Gravetye Beauty' as a hardy flowering climber (votes 9 for), from Mr. E. Markham. See p. 511.

To *Ceanothus azureus* var. *Candolleanus* as a hardy flowering shrub (votes unanimous), from Mrs. Graham Smith, Wokingham. See p. 510.

Other Exhibits.

Mr. R. Colpoys Wood, West Drayton : shrubs and herbaceous plants.

Miss Hopkins, Coulsdon : rock plants.

Mr. L. Lawrence, Taplow : succulents.

Viscountess Byng of Vimy, Thorpe-le-Soken : *Eupatorium Weinmannianum*.

Collingwood Ingram, Esq., Benenden : Antholyza-Montbretia hybrid,

Carduus sp., Watsonia sp.

Lionel de Rothschild, Esq., Exbury : *Tricyrtis formosana*.

Mr. A. G. Weeks, Limsfield : *Gentiana sino-ornata praecox*.

Messrs. Prichard, Christchurch : *Lobelia syphilitica nana*.

ORCHID COMMITTEE.—F. J. HANBURY, Esq., in the Chair, and eight other members present.

No awards were made by the Committee on this date.

JOINT DAHLIA COMMITTEE.—Mr. D. B. CRANE in the Chair, and ten other members present.

Selected for trial at Wisley.

From Messrs. Ballego, Leiden, Holland : 'Salmon Giant.'

From Messrs. Cheal, Crawley : 'Ryde,' 'Ventnor.'

From A. J. Cobb, Esq., Reading : 'Princeton' (Min. Dec.), 'Walter Hitchins' (Informal Small Dec.).

From Mr. J. B. Riding, Chingford : 'Doria,' 'Eugenia,' 'Little Edith.'

From Messrs. Stredwick, St. Leonards-on-Sea : 'Emily Hall' (Large Dec.), 'F. Riley' (Large Dec.), 'Kaffir,' 'Spark' (Small Dec.), 'Squirrel,' 'Somali' (Small Dec.), 'Stalwart' (Large Dec.), 'St. Leonards,' 'Winona Drayson.'

From Mr. J. T. West, Brentwood : 'Cerise' (Med. Dec.), 'Creole' (Med. Dec.), 'Minnie West' (Med. Dec.), 'Rosalingda' (Pompon).

Dahlias were also submitted by Mr. W. Joyce, Englefield Green ; Mr. S. Ogg, Swanley ; Mr. G. J. Squibbs, Burton-on-Trent.

GREAT AUTUMN SHOW.

SEPTEMBER 25-27, 1935. NATIONAL HALL, OLYMPIA.

LIST OF AWARDS.

The Coronation Cup, for the best exhibit in the Show.

To Messrs. Bees, Chester, for a mixed group of herbaceous plants, Gladioli and Lilies.

The Wigan Cup, for the best exhibit of Roses.

To Messrs. Alex. Dickson, Newtownards, N. Ireland.

Gold Medal.

To Messrs. Alex. Dickson, Newtownards, for Roses.

To Messrs. Hillier, Winchester, for a mixed group of trees, shrubs, herbaceous plants and Water Lilies.

To Messrs. Sutton, Reading, for vegetables.

To Messrs. Dobbie, Edinburgh, for Dahlias.

To Mr. Stuart Ogg, Swanley, for Dahlias.

To Messrs. Bees, Chester, for a mixed group of herbaceous plants, Gladioli and Lilies.

Silver Cup.

To Messrs. S. McGredy, Portadown, for Roses.

To Messrs. R. Wallace, Tunbridge Wells, for a mixed group of trees, shrubs, herbaceous and bulbous plants.

To Messrs. J. Waterer, Sons & Crisp, Bagshot, for shrubs.

To Messrs. Charlesworth, Haywards Heath, for Orchids.

To Messrs. Laxton Bros., Bedford, for fruit.

To Messrs. Carter Page, London Wall, for Dahlias.

To Messrs. Dickson & Robinson, Manchester, for Dahlias.

To Mr. J. B. Ridg, Chingford, for Dahlias.

To Messrs. Blackmore & Langdon, Bath, for Begonias.

To Messrs. Carters' Tested Seeds, Raynes Park, for a mixed group of greenhouse plants, annuals, etc.

Silver-gilt Flora Medal.

To Messrs. Chaplin Bros., Waltham Cross, for Roses.

To Messrs. A. Charlton, Rotherfield, for trees and shrubs.

To Messrs. J. Cheal, Crawley, for shrubs.

To Messrs. Dartington Hall, Ltd., Totnes, for trees and shrubs.

To Messrs. W. T. & H. E. Neale, Newhaven, for Succulents and Gazanias.

To Messrs. L. R. Russell, Richmond, Surrey, for stove and greenhouse plants.

To Messrs. H. G. Alexander, Tetbury, for Orchids.

To Messrs. Black & Flory, Slough, Bucks., for Orchids.

To Messrs. Wakeley Bros., Bankside, S.E., for Gladioli.

To Mr. J. T. West, Brentwood, for Dahlias.

To Mr. H. Woolman, Shirley, nr. Birmingham, for a mixed group of Dahlias and Chrysanthemums.

To Messrs. Keith Luxford, Sawbridgeworth, for Chrysanthemums.

Silver-gilt Banksian Medal.

To Mr. C. Gregory, Chilwell, Notts., for Roses.

To Mr. E. J. Hicks, Hurst, nr. Reading, for Roses.

To Messrs. Donard Nursery Co., Newcastle, Co. Down, for shrubs.

To Messrs. Knap Hill Nursery, Ltd., Woking, for a mixed group of shrubs and Lilies.

To Mr. W. J. Marchant, Wimborne, for shrubs.

To Messrs. Maxwell & Beale, Broadstone, for heath garden.

To Messrs. L. R. Russell, Richmond, Surrey, for Clematises, ornamental vines and other shrubs.

To Mrs. B. R. Morley, Bath, for stove and greenhouse plants.

To Messrs. Sanders, St. Albans, for Orchids.

To Messrs. R. H. Bath, Wisbech, for a mixed group of Gladioli and Dahlias.

To Messrs. Jarman, Chard, for Dahlias.

To Messrs. Allwood, Haywards Heath, for Perpetual-flowering and Malmaison Carnations.

To Mr. Ernest Ballard, Colwall, nr. Malvern, for Michaelmas Daisies.

To Messrs. C. Engelmann, Saffron Walden, for Carnations.

To Mr. James MacDonald, Harpenden, for a lawn garden.

To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

To Messrs. Wm. Wood, Taplow, for a mixed group of Dahlias and herbaceous plants.

clxiv PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Silver-gilt Hogg Medal.

To Messrs. T. Rivers, Sawbridgeworth, for fruit trees in pots and gathered fruit.

To Studley College, Warwickshire, for fruit.

To Swanley Horticultural College, Swanley, for fruit.

Silver-gilt Knightian Medal.

To Messrs. Dobbie, Edinburgh, for Potatos.

To Messrs. Fogwills, Guildford, for vegetables.

Silver Flora Medal.

To Messrs. Dobbie, Edinburgh, for Roses.

To Messrs. Dowty's Rosery, Wokingham, for Roses.

To Mr. T. Robinson, Nottingham, for Roses.

To Messrs. J. Waterer, Sons & Crisp, Twyford, for Roses.

To Messrs. G. Jackman, Woking, for Clematises.

To Messrs. G. Reuthe, Keston, for shrubs.

To Messrs. W. A. Constable, Tunbridge Wells, for Lilies.

To Messrs. Clarence Elliott, Stevenage, for rock-garden plants.

To Messrs. J. Waterer, Sons & Crisp, Twyford, for rock-garden plants.

To Messrs. Stuart Low, Tunbridge Wells, for Orchids.

To Messrs. J. Cheal, Crawley, for Dahlias.

To Messrs. Dobbie, Edinburgh, for Gladioli.

To Messrs. Wm. Treseder, Cardiff, for Dahlias.

To Messrs. Allwood, Haywards Heath, for Border Carnations and Pinks.

To Messrs. The Ashington Nurseries, Ashington, for Carnations.

To Messrs. Barr, Covent Garden, for a mixed group of Michaelmas Daisies, Montbretias and autumn-flowering bulbs.

To Messrs. Stuart Low, Enfield, for Carnations.

To Messrs. M. Prichard, Christchurch, for herbaceous plants.

To Messrs. J. Waterer, Sons & Crisp, Twyford, for a mixed group of Dahlias, Chrysanthemums and herbaceous plants.

To Mr. W. Wells, jun., Merstham, for herbaceous plants.

Silver Banksian Medal.

To Messrs. Ben. R. Cant, Colchester, for Roses.

To Messrs. Frank Cant, Colchester, for Roses.

To Messrs. Dickson, Edinburgh, for Roses.

To Messrs. George Prince, Longworth, for Roses.

To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for trees and shrubs.

To Mr. H. Hemsley, Crawley, for trees and shrubs.

To Messrs. Neves Hollamby's Nurseries, Ltd., Groombridge, for ornamental vines and other shrubs.

To Mr. R. C. Notcutt, Woodbridge, for shrubs.

To Messrs. D. Stewart, Wimborne, for Conifers and shrubs.

To Messrs. R. Veitch, Exeter, for trees and shrubs.

To Mr. G. G. Whitelegg, Chislehurst, for Conifers.

To Mr. T. M. Endean, Laindon, for Cacti and Succulents.

To Mr. Amos Perry, Enfield, for a mixed group of aquatic, herbaceous and bulbous plants.

To Mr. Amos Perry, for submerged aquatics.

To Messrs. M. Prichard, Christchurch, for rock-garden plants.

To Messrs. Brown & Such, Slough, Bucks., for Dahlias.

To Messrs. Daniels, Norwich, for a mixed group of Gladioli, Montbretias and herbaceous plants.

To Mr. H. Hemsley, Crawley, for Dahlias.

To Messrs. Kelway, Langport, for Gladioli.

To Messrs. W. H. Simpson, Birmingham, for a mixed group of Gladioli, Montbretias and Michaelmas Daisies.

To Mr. F. J. Bell, Whitley Bay, Northumberland, for Pansies and Violas.

To Messrs. G. Bunyard, Maidstone, for a mixed group of herbaceous plants and shrubs.

To Messrs. Wm. Cutbush, Barnet, for a mixed group of herbaceous plants, Chrysanthemums, Dahlias and shrubs.

To Mr. H. J. Jones, Lewisham, for Chrysanthemums.

To Mr. Ernest Ladhams, Godalming, for a mixed group of shrubs and herbaceous plants.

To Messrs. H. C. Lawrence, Chatham, for Chrysanthemums.

To Mr. Wm. Yandell, Maidenhead, for a mixed group of Chrysanthemums and Violas.

Silver Hogg Medal.

To Messrs. J. C. Allgrove, Langley, for fruit trees in pots and gathered fruit.

Silver Knightian Medal.

To Messrs. Dickson & Robinson, Manchester, for Onions.

To Messrs. E. Webb, Stourbridge, for vegetables.

Silver Lindley Medal.

To The University of Reading, for Dahlias raised at the University.

Flora Medal.

To Mr. Henry Drew, Longworth, for Roses.

To Mr. R. Murrell, Shepton-on-Thames, for Roses.

To Messrs. D. Prior, Colchester, for Roses.

To Messrs. Brookside Nurseries, Headington, for a mixed group of herbaceous and rock-garden plants.

To Messrs. The Hocker Edge Gardens, Cranbrook, for a mixed group of Lilies, Nerines and rock-garden plants.

To Messrs. W. E. Th. Ingwersen, East Grinstead, for rock-garden plants.

To Messrs. John Peed, West Norwood, for greenhouse plants.

To Messrs. G. Reuthe, Keston, for rock-garden plants.

To Mr. W. Wells, jun., Merstham, for rock-garden plants.

To Messrs. Bakers, Codsall, for herbaceous plants.

To Mr. J. F. Cumming, Wisbech, for herbaceous plants including varieties of

Scabiosa caucasica.

To Messrs. John Forbes, Hawick, for Phloxes and other herbaceous plants.

To Messrs. The Gayborder Nurseries, Melbourne, Derbyshire, for Michaelmas Daisies and other herbaceous plants.

To Messrs. G. Lubbe, Holland, for Kniphofias.

To Mr. A. Miles, Bickley, for herbaceous plants.

To Messrs. Rich & Cooling, Bath, for herbaceous plants.

To Messrs. Storrie, Thynne, Dundee, for herbaceous plants.

Banksian Medal.

To Mr. W. E. B. Archer & Daughter, Ashford, for Roses.

To Messrs. Laxton Bros., Bedford, for Roses.

To Mr. E. B. Le Grice, North Walsham, for Roses.

To Messrs. G. F. Letts, Hadleigh, for Roses.

To Messrs. Wm. Lowe, Beeston, for Roses.

To Mr. John Mattock, Headington, for Roses.

To Messrs. Redgrove & Patrick, Seal, Sevenoaks, for Roses.

To Messrs. A. Warner, Colchester, for Roses.

To Messrs. Wheatcroft, Nottingham, for Roses

To Mr. H. A. Brown, South Chingford, for Fuchsias.

To Mr. R. Aireton, Poole, for trees and shrubs.

To Messrs. Gurteen & Ritson, Worth Park Nurseries, Three Bridges, for Conifers and shrubs.

To Messrs. W. G. Haskins, Bournemouth West, for Clematises.

To Mr. J. Hogger, Felbridge, for Conifers and other trees and shrubs.

To Mr. J. Klinkert, Richmond, Surrey, for Topiary.

To The Alpine Nurseries, Wimborne, for rock-garden plants.

To Messrs. Casburn, Bedford, & Page, Trumpington, for rock-garden plants.

To Messrs. Clark, Dover, for rock-garden plants.

To Messrs. C. Engelmann, Saffron Walden, for mixed group of Gerberas and Sempervivums.

To Messrs. J. Robinson, Eltham, for rock-gardens plants.

To Messrs. W. H. Rogers, Southampton, for rock-garden plants.

To Mr. G. E. Welch, Cambridge, for rock-garden plants.

To Messrs. T. Carlile, Twyford, for herbaceous plants

To Mr. R. J. Case, Taunton, for a mixed group of zonal Pelargoniums and Gentians.

To Messrs. G. & A. Clark, Dover, for herbaceous plants.

To Messrs. I. House, Westbury-on-Trym, for a mixed group of Scabiouses, Gaillardias and Kniphofias.

To Mr. F. Rich, Worcester, for herbaceous plants.

To Messrs. T. Simmons, Finchley, for Violas.

To Messrs. Gibson, Cranleigh, for Dahlias.

To Messrs. The Godalming Nurseries, Godalming, for Dahlias.

To Messrs. Hewitt, Solihull, for a mixed group of Dahlias and herbaceous plants.

To Messrs. Wm. Lowe, Beeston, for Dahlias.

To Messrs. Neale, Solihull, for Dahlias.

To Messrs. Redgrove & Patrick, Seal, Sevenoaks, for a mixed group of Dahlias and herbaceous plants.

To Messrs. J. F. Spencer, Hockley, for Dahlias.

To Messrs. S. J. Goodliffe, Bishops Stortford, for Dahlias.

Knightian Medal.

To The Central Committee, London Gardens for the Unemployed, Euston Road, for produce grown by unemployed men in different parts of the country.

To Irish Free State, Dept. of Agriculture, Dublin, for Potatos.

To Messrs. Toogood, Southampton, for vegetables.

SEPTEMBER 25, 1935.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twenty-two other members present.

The Tomato 'Garvey Star' ('Liberty' × 'Ailsa Craig' × 'Stonor's M.P.'), exhibited by Mr. W. F. Sands, Antrim Road Lisburn, Ulster, was recommended for inclusion in the next trial of Tomatos at Wisley.

Exhibits.

Mr. W. E. Sands, Lisburn, Ulster: Tomatos 'Garvey Star' and 'Alice.'

Mrs. M. Dozell, Eltham: seedling Apple.

Mr. W. H. Divers, V.M.H., Hook: Plum 'Wierton Gage.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty-four other members present.

Awards Recommended:—

Award of Merit.

To Chrysanthemum 'Felicity' for cutting and market (votes unanimous), from Messrs. Johnson, Tibshelf. See p. 510.

To Chrysanthemum 'Purity' for cutting and market (votes unanimous), from Mr. T. Stevenson, Hillingdon. See p. 510.

To Chrysanthemum 'Tibshelf Cream' for cutting and market (votes unanimous), from Messrs. Johnson. See p. 511.

To Chrysanthemum 'Tibshelf Red' for cutting and market (votes 14 for, 2 against), from Messrs. Johnson. See p. 511.

To Chrysanthemum 'Valiant' for cutting and market (votes unanimous), from Messrs. Johnson. See p. 511.

Selected for trial at Wisley.

Aster 'Moerheim Gem' from Messrs. Prichard, Christchurch.

Aster 'Petunia' from Mr. E. Ballard, Colwall.

Dianthus Allwoodii 'Pearl' from Messrs. Allwood, Haywards Heath.

Other Exhibits.

Mr. G. H. Baxter, Halstead: Chrysanthemum 'Aubrey Lowe.'

Messrs. Blom, Addlestone: Roses.

Mr. F. Hancock, Mansfield: Chrysanthemum 'Sidney Hancock.'

Mr. C. T. Kipping, Chelmsford: Chrysanthemums.

Messrs. Lubbe, Oegstgeest, Holland: Kniphofias 'Dr. M. J. Sirks' and seedlings.

Messrs. Prior, Colchester: Roses 'Enid' and 'Betty Prior.'

Mr. E. Rich, Worcester: Aster *Amellus* 'Lady Hindlip.'

Mr. E. Riley, Alfreton: Chrysanthemums.

Messrs. Simmons, Finchley: Chrysanthemum 'Dollis Beauty.'

FLORAL COMMITTEE B.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended:—

Award of Merit.

To Chrysanthemum *erubescens* as a hardy flowering plant (votes unanimous), from the Director, Royal Botanic Gardens, Kew. See p. 510.

To *Hibiscus syriacus* 'Hamabo' as a hardy flowering shrub (votes 10 for, 5 against), from Mr. R. C. Notcutt, Woodbridge. See p. 511.

To *Physalis Franchetii* var. *gigantea* as a hardy ornamental fruiting plant (votes 14 for, 1 against), from Mr. Amos Perry, Enfield.

Preliminary Commendation.

To *Androcymbium melanthoides* (votes unanimous), from W. F. Higgins, Esq., Croydon.

To *Primula Sheriffii* (votes 17 for), from T. Hay, Esq., Hyde Park, W. 2.

Other Exhibits.

Mr. A. Blandford, West Horsley : *Cupressus macrocarpa Blandfordii*.

Mr. J. Hancock, Mansfield : *Asparagus plumosus Mossii*, *A. Sprengeri giganteus*, *A. plumosus* 'Dainty Fairy.'

Capt. H. G. Hawker, Ermington : *Hedychium* sp. Farrer 1098.

Messrs. Stuart Low, Enfield : *Cupressus macrocarpa lutea compacta*.

Mr. H. Milford, Chedworth : *Aloe polyphylla*.

Mr. R. C. Notcutt, Woodbridge : *Syringa microphylla*.

Mr. Amos Perry, Enfield : *Physalis Franchetii nana*.

Messrs. Russell, Richmond : *Thunbergia laurifolia*, *Bougainvillea* 'Lady Hudson,' *Clematis montana* 'Pink Perfection.'

F. B. Smith, Esq., Romsey : *Gilia coronopifolia*.

Messrs. Stewart, Ferndown : *Thuya occidentalis nana aurea*.

Messrs. Waterer, Bagshot : *Malus* 'Golden Hornet.'

Mr. G. G. Whitelegg, Chislehurst : *Cassia corymbosa*.

P. D. Williams, Esq., St. Keverne : *Sorbus Esserteauiana*.

ORCHID COMMITTEE.—F. J. HANBURY, Esq., in the Chair, and eighteen other members present.

Awards Recommended :—*Award of Merit.*

To *Cattleya* × *virginialis* var. 'Olympia' (*Lueddemanniana* × 'Suzanne Hye') (votes 13 for, 1 against), from Messrs. Sanders, St. Albans. See p. 510.

To *Laeliocattleya* × 'Campagna' (*C.* × 'Heliodor' × *L.-c.* × 'Canberra') (votes 18 for), from Lionel de Rothschild, Esq., Exbury. See p. 511.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., M.V.O., in the Chair, and ten other members present.

Selected for trial at Wisley.

From Messrs. Ballego, Leiden, Holland : 'Selma Schöne.'

From Mr. J. B. Riding, Chingford : 'Valerie Forman' (Pompon).

From Messrs. Sandford, Mildenhall : 'Trimley Beauty.'

From Mr. J. T. West, Brentwood : 'Bill' (Med. Dec.), 'Maisie West,' 'Rosine' (Med. Dec.).

From Mr. H. Woolman, Birmingham : 'Double Caldecote Castle' (Small Dec.).

Dahlias were also submitted by Messrs. Cheal, Crawley ; Mr. R. Cook, Banff ; Mr. R. T. Halliday, Lanark ; Mr. T. W. Pannell, Dunmow.

THE ROYAL HORTICULTURAL SOCIETY

Vincent Square, Westminster, London, S.W. 1

Election and Privileges of Fellows and Associates and Terms of Subscription.

1.—Anyone interested in Horticulture is eligible for election and is invited to join the Society. Women as well as men are admissible as Fellows, but firms and corporations are not admissible.

2.—Every candidate for admission as a Fellow of the Society must be nominated in writing by a Fellow of the Society on a Nomination Form, and must himself duly complete and sign the application for admission on the said Form and send it by post or otherwise to the Secretary of the Society. A list of the candidates will be posted in the Society's Hall at least two weeks before the date of election, and no candidate not included in the list will be considered for election. Every election will be made at a meeting of the Council of the Society, the majority of the Members of the Council present and voting to elect or reject the candidate. The Secretary will inform the candidate of his election, and will at the same time send to him a print of the Charter and Bye-laws of the Society.

3.—The Society being incorporated by Royal Charter, the Fellows incur no personal liability whatsoever beyond the payment of their Annual Subscriptions.

FELLOWS.

A Fellow subscribing FOUR Guineas a year (or commuting for Forty Guineas) is entitled—

- 1.—To ONE Non-transferable (personal) Pass and FIVE Transferable Tickets admitting to all the Society's Meetings, and to the Gardens.
- 2.—To vote at all Meetings of the Society.
- 3.—To attend the Lectures.
- 4.—Admission to the Society's Gardens at Witley.
- 5.—To the use of the Library at the Society's Hall.
- 6.—To a copy of the Society's *Journal*, containing the Papers read at all Meetings and Conferences, Reports of Trials made at the Gardens, and descriptions and illustrations of new or rare plants, &c.
- 7.—To a share (in proportion to the annual subscription) of such surplus or waste plants * as may be available for distribution. Fellows residing beyond a radius of 35 miles from London (by the A.B.C. Railway Guide) are entitled to a double share.
- 8.—Subject to certain fees and limitations, to obtain Analyses of Manures, Soils, &c., or advice on such subjects by letter.
- 9.—To have their gardens inspected by the Society's Officer at the following fees:—
One day, £3 8s.; two days, £5 5s.; plus all out-of-pocket expenses.
- 10.—To exhibit at all Meetings, and to send seeds, plants, &c., for trial to the Society's Gardens.
- 11.—To purchase, at reduced rates, such fruit and vegetables as are not required for the experimental purposes of the Society.
- 12.—To recommend any lady or gentleman for election as a Fellow.

A Fellow subscribing TWO Guineas a year (or commuting for Twenty-five Guineas) is entitled—

- 1.—To ONE Non-transferable Pass and TWO Transferable Tickets.
- 2.—To all the other privileges mentioned in Nos. 3 to 12 above.

A Fellow subscribing ONE Guinea a year (or commuting for Fifteen Guineas) is entitled—

To ONE Transferable Ticket (in lieu of the Non-transferable Personal Pass), and all the other privileges mentioned in Nos. 3 to 12 above.

ASSOCIATES.

An Associate subscribing 10s. 6d. a year is entitled—

To ONE Non-transferable Pass, and to privileges mentioned in Nos. 3, 4, 5, 6 and 10 above.

Associates must be persons earning their livelihood by working as *bona fide* Gardeners, or employees in a Public or Botanic Garden, Nursery, Private or Market Garden, or Seed Establishment, or Journalists writing for country or foreign papers, and must be recommended for election by Two Fellows of the Society.

AFFILIATION OF KINDRED SOCIETIES.

Local Horticultural and Cottage Garden Societies and Allotment Societies may be affiliated to the Royal Horticultural Society. For particulars apply to the Secretary, R.H.S.

* **SURPLUS PLANTS.** Note: These are plants which are surplus to the requirements of the Witley Gardens, and as the Garden becomes fully planted, the number available may be diminished.

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

NOTICES TO FELLOWS.

SUBSCRIPTIONS.

All Annual Subscriptions are payable in advance on January 1 of each year. Fellows can at any time relieve themselves of any further trouble in the matter, either by compounding by payment of a lump sum for Life Membership, or by obtaining from the Secretary a Banker's Order, instructing their bankers to pay their subscription on January 1 each year.

CHANGE OF ADDRESS.

Fellows are reminded that it would be of material assistance to the Secretary in dispatching their tickets, plant distribution lists, JOURNAL, or any other communications that may have to be addressed to them, if any change of address, or change in bankers through whom their subscriptions are paid, is notified to him as soon as possible.

PLANT DISTRIBUTION.

Lists of seeds and plants available for distribution in 1936, together with the form of application for them, will be distributed with the January JOURNAL. The application forms must be received on or before March 16, 1936, except from Fellows resident abroad. Should by any chance these lists and forms be mislaid, Fellows should notify the Secretary immediately, so that a duplicate set of papers may be sent.

CALENDAR.

December 10, 1-5 P.M.—Fortnightly Meeting and Show, the last meeting of the year. At this meeting the Society's annual awards are made, and the names of the recipients will be published in the Annual Report appearing in the February number of the JOURNAL. At the Show itself Orchids, Fruit, and probably some early forced bulbs will be exhibited. Pictures, photographs and plans will be shown, and also garden ornaments, labels, gates, etc., from horticultural sundriesmen.

January 14, 1-5 P.M.—Fortnightly Meeting and Show. At this Show exhibits of Cypripediums are specially invited, and early spring flowers are likely to be exhibited.

In the afternoon there will be a lecture in the Lecture Room, at 3.30, arranged by the Institute of Landscape Architects, by Mr. RUSSELL PAGE on "The Influence of Climate on Garden Design."

January 28, 1-5 P.M.—Fortnightly Meeting and Show. Rock plants, early spring flowers and forced shrubs will be special features. Fellows will have an opportunity of selecting plants for refurnishing the gaps in their rock gardens. Orchids and fruit will also be represented.

There will be a special exhibit from Wisley on "Winter Stages of Pests and Diseases of Fruits and other Plants."

In the afternoon there will be a lecture in the Lecture Room at 3.30 on "The Care of Old Trees" by Mr. A. D. C. LE SURUR.

WISLEY GARDENS.

On December 4 and 5 a practical demonstration on the Pruning of Fruit Trees will be given if weather permits between the hours of 2-4 P.M. on each day. Those intending to be present should notify the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand.

In the Garden December is perhaps the month when fewest flowers are to be seen. A few winter flowering shrubs such as *Viburnum fragrans*, *Hamamelis virginiana*, *Prunus subhirtella autumnalis* and *Jasminum nudiflorum* will be in bloom however, and among the heaths the forms of *Erica carnea* will be fast showing flower, especially towards the latter part of the month. *Erica lusitanica* and the hybrid *Erica* × *darleyensis* may also be expected to be in flower.

Around the Pond sides the coloured stems of the species of *Salix* and *Cornus* are particularly bright at this season, and in close proximity there may still be a few Barberries with coloured foliage. The fruits of Barberries have this year suffered considerably from the October frost which has had the effect of discolouring the masses of berries usually so attractive at Wisley.

On the Rock Garden the early blooming Snowdrops, *Galanthus Olgae*, may still be seen, while *Primula Winteri* will be fast coming into flower.

The Alpine House, even in the late months of the year, usually includes something of interest and a visit should not be omitted.

In the Greenhouse plants in flower will be chiefly Pelargoniums, Acacias, a few Cape Heaths, and *Tibouchina semidecandra*.

HALL LETTINGS.

Fellows may be interested in a somewhat unusual show which is to be held in the New Hall on December 13 and 14, namely a Bird and Aquarium Show. This is being organized by the Marshall Press, Ltd., Milford Lane, W.C. 2, to whom any inquiries should be addressed.

CONFERENCE ON ALPINE PLANTS.

In co-operation with the Alpine Garden Society, a Conference on Alpine Plants is being held next spring, May 5-7. On the first two days there will be a special show of Alpines in the New Hall, which will include both competitive classes for amateurs and non-competitive classes for the trade.

CONFERENCE PROGRAMME.

TUESDAY, MAY 5, 1936, AFTERNOON SESSION, 3-5.

Chairman.—Lord ABERCONWAY, C.B.E., V.M.H., President of the Royal Horticultural Society, supported by The Viscountess BYNG of Vimy, President of the Alpine Garden Society.

Introductory Address by the President of the Royal Horticultural Society.

"Rock Gardening of Different Periods in Different Countries," by Lady ROCKLEY, C.B.E., and Mr. CLEVELAND MORGAN (Canada).

"The Rise of Modern Rock Gardening and its Future," by Mr. R. WALLACE.

WEDNESDAY, MAY 6, 1936. MORNING SESSION, 11-1 P.M.

"Utilization of Natural Slopes," by Mr. GEORGE DILLISTONE."

"Utilization of Flat Sites," by Mr. W. E. TH. INGWERSEN.

AFTERNOON SESSION, 2.30-5.

"Cultivation of Rock Plants: General," by Mr. R. E. COOPER.

"Difficult Rock Plants," by Mr. C. T. MUSGRAVE.

THURSDAY, MAY 7, 1936. MORNING SESSION, 11-1 P.M.

Rock Gardening in Sunny Countries—

"Rock Gardening in South Africa," by Miss STANFORD (S.A.).

"Rock Gardening in California," by W. HERTRICH (U.S.A.).

AFTERNOON SESSION, 2.30-5.

"The Alpine House," by Mr. P. ROSENHEIM.

"Propagation," by Mr. M. PRICHARD.

The following are among those who will take part in the discussions :

Mr. F. BARKER.	Dr. JENKIN.	Dr. STOKER.
Mr. J. W. BESANT.	Mr. GAVIN JONES.	Capt. SYMONS-JEUNE.
Mr. AYMON CORREVON.	Professor LYTTEL.	Mr. J. T. WALL.
Mr. CLARENCE ELLIOTT.	Mr. R. H. MACAULAY.	Mr. BEN WELLS.
Mr. R. L. HARROW.	Mr. RENTON.	Mr. JOHN WOOD.
Mr. S. JACOBS.	Major F. C. STERN.	

BRITISH FLORAL ART DIPLOMA.

The autumn examination for the British Floral Art Diploma was held early in October, and of the fourteen candidates who entered nine were successful in gaining the Diploma. The floral designs made by the candidates were on view to the public after the examination, and some of them showed a high standard of efficiency. It is satisfactory to note that several candidates at the autumn examination came from the provinces, showing that the value of the Diploma is becoming more widely known ; one young florist on a visit to this country from New Zealand took the opportunity of entering for the examination before returning home, and gained the Diploma.

HORTICULTURAL EXAMINATIONS.

Intending candidates for the Society's 1936 examinations are reminded that the syllabus, giving the dates for next year's examinations and entry forms, may now be obtained from the Society's Offices.

PUBLICATIONS.

Diary.—The R.H.S. Gardeners' Diary now appears for the twenty-fifth year. In addition to the usual necessary information so important to all gardeners, space has been found for notes on Crocuses and Ornamental Grasses. Copies may be obtained from the Secretary or any bookseller. Price 2s. in cloth, 5s. in leather refillable case. Refills 1s. 6d. Postage 2d. a copy.

Daffodil Year Book.—The Daffodil Year Books for 1933, 1934 and 1935 are available. Price 5s. in limp covers, 6s. in stiff covers.

Lily Year Book.—The Lily Year Books for 1933, 1934 and 1935 are available. Price 5s. in limp covers, 6s. in stiff covers.

Report of Apple and Pear Conference.—Apples and Pears: Varieties and Cultivation in 1934. Price 7s. 6d.

Report of Cherry and Soft Fruit Conference.—Cherries and Soft Fruits: Varieties and Cultivation in 1935. Price 6s.

GENERAL MEETINGS.

OCTOBER 8-9, 1935.

FRUIT AND VEGETABLE SHOW.

CHIEF AWARDS IN THE COMPETITIVE CLASSES FOR FRUIT AND VEGETABLES.

FRUIT.

The Gordon-Lennox Cup, for the most meritorious display of fruit staged by an amateur.

To Mrs. C. M. Murray, Sunninghill, Ascot (gr. Mr. R. Bowering).

The George Monro Memorial Challenge Cup, for the best exhibit of Grapes staged by an amateur.

To Mrs. C. M. Murray, Sunninghill, Ascot (gr. Mr. R. Bowering).

Class 1.—Collection of nine dishes of ripe dessert fruit.

First Prize, Silver Hogg Medal and £8.

To Lord Swaythling, Southampton (gr. Mr. F. J. Rose).

Class 2.—Collection of six dishes of ripe dessert fruit.

First Prize, Silver Hogg Medal and £5.

To the Duke of St. Albans, Arnold, Nottingham (gr. Mr. A. Miles).

Class 3.—Collection of eight bunches of Grapes.

First Prize, Silver Hogg Medal and £12.

To C. G. A. Nix, Esq., Tilgate, Crawley (gr. Mr. E. Neal).

Class 4.—Collection of four bunches of Grapes.

First Prize, Silver Hogg Medal and £5.

To Mrs. C. M. Murray, Sunninghill, Ascot (gr. Mr. R. Bowering).

Class 20.—Collection of twenty-four dishes of hardy fruits.

First Prize, Silver Hogg Medal and £12.

To Sir Randolph Baker, Bt., Blandford, Dorset (gr. Mr. A. E. Usher).

Class 21.—Collection of twelve dessert varieties of Apples.

First Prize, Fruiterers' Company's Silver-gilt Medal and £5.

To Mrs. Walter Rawnsley, Alford, Lincs. (gr. Mr. T. Vickers).

Class 22.—Collection of twelve culinary varieties of Apples.

First Prize, Fruiterers' Company's Silver Medal and £5.

To Mrs. Walter Rawnsley, Alford, Lincs. (gr. Mr. T. Vickers).

Class 27.—Collection of twelve dessert varieties of Pears.

First Prize, Silver-gilt Hogg Medal and £5.

To Sir Randolph Baker, Bt., Blandford, Dorset (gr. Mr. A. E. Usher).

Class 95.—Market Growers. Four British standard half-boxes of 'Cox's Orange Pippin' Apples.

First Prize, Silver Hogg Medal and £4.

To Mr. R. J. Burrell, Bury St. Edmunds.

Class 96.—Market Growers. Four British standard half-boxes of 'Worcester Pearmain' Apples.

First Prize, Silver Hogg Medal and £4.

To the Rt. Hon. David Lloyd George, Churt, Surrey.

Class 97.—Market Growers. Four British standard half-boxes of any dessert variety of Apple other than 'Cox's Orange Pippin' or 'Worcester Pearmain.'

First Prize, Silver Hogg Medal and £4.

To Mr. R. J. Burrell, Bury St. Edmunds.

Class 98.—Market Growers. Four British standard boxes of 'Bramley's Seedling' Apple.

First Prize, Silver Hogg Medal and £4.

To Hollesley Farm, nr. Woodbridge.

Class 99.—Market Growers. Four British standard boxes of any culinary variety of Apple other than 'Bramley's Seedling.'

First Prize, Silver Hogg Medal and £4.

To Hollesley Farm, nr. Woodbridge.

Class 100.—Market Growers. Three one-layer boxes of 'Cox's Orange Pippin' Apple.

First Prize, Hogg Medal and £2.

To the Grove Fruit Farm, West Horsley.

Class 101.—Market Growers. Three one-layer boxes of any dessert variety of Apple other than 'Cox's Orange Pippin.'

First Prize, Hogg Medal and £2.

To Mr. A. T. Hales, Sittingbourne.

Class 102.—Market Growers. One one-layer box of a dessert variety of Apple not offered for sale in a printed catalogue or price-list before 1916.

First Prize, Hogg Medal and £1.

To Mr. W. Brice, Higham.

Class 103.—Market Growers. Three British standard half-boxes of 'Conference' Pears.

First Prize, Silver Hogg Medal and £4.

To Mr. T. Neame, Faversham.

Class 104.—Market Growers. Three one-layer boxes of 'Conference' Pears.

First Prize, Hogg Medal and £2.

To Mr. T. Neame, Faversham.

Class 105.—Market Growers. Three one-layer boxes of 'Doyenné du Comice' Pears.

First Prize, Hogg Medal and £2.

To Mr. T. Neame, Faversham.

Class 106.—Market Growers. Three one-layer boxes of any dessert variety of Pear other than 'Conference' or 'Doyenné du Comice.'

First Prize, Hogg Medal and £2.

To Mr. T. Neame, Faversham.

VEGETABLES.

The R.H.S. Vegetable Challenge Cup, for the highest number of points in the vegetable classes.

To Sir Randolph Baker, Bt., Blandford, Dorset.

Class 201.—A table of vegetables.

First Prize, The Riddell Trophy and £16.

To Sir Randolph Baker, Bt., Blandford, Dorset (gr. Mr. A. E. Usher).

Class 202.—A collection of twelve kinds of vegetables.

First Prize, the Sutton Cup and £8.

To Mrs. Peter Adam, Kidderminster (gr. Mr. W. Pugh).

A lecture was given by Mr. G. Fox-Wilson on "Fruit Pests: their Effect and Detection" (p. 536).

Chairman, Mr. E. A. Laxton, V.M.H.

OCTOBER 8, 1935.

FLORAL COMMITTEE A.—Mr. J. M. BRIDGFORD in the Chair, and nineteen other members present.

Awards Recommended:—

Silver-gilt Banksian Medal.

To Messrs. Dobbie, Edinburgh, for Dahlias and Gladioli.

To Mr. S. Ogg, Swanley, for Dahlias.

To Messrs. Carter Page, London, for Dahlias.

To Mr. J. B. Riding, Chingford, for Dahlias.

To Messrs. Waterer Sons and Crisp, Twyford, for perennial Asters.

To Messrs. Wood, Taplow, for perennial Asters.

Silver Flora Medal.

To Messrs. Jarman, Chard, for Dahlias.

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.

To Messrs. Peed, West Norwood, for Begonias.

To Mr. J. T. West, Brentwood, for Dahlias.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Barr, London, for perennial Asters.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. Dickson, Newtownards, for Roses.

To Messrs. Engelmann, Saffron Walden, for Carnations.
To Mr. E. Ladhams, Elstead, for herbaceous plants and shrubs.
To Messrs. Prior, Colchester, for Roses.

Flora Medal.

To A. T. Barnes, Esq., Bedford, for Dahlias.
To Messrs. Carlile, Twyford, for perennial Asters.
To Mr. J. F. Cumming, Wisbech, for Scabious, etc.

Banksian Medal.

To Messrs. Baker, Codsall, for herbaceous plants.
To Messrs. B. R. Cant, Colchester, for Roses.
To Messrs. Dowty's Rosery, Wokingham, for Roses.
To Messrs. Greenyer, Worthing, for Chrysanthemums.
To Mr. T. S. Hughes, Great Missenden, for Chrysanthemums.
To Mr. A. Miles, Bickley, for perennial Asters.

Award of Merit.

To Chrysanthemum 'Appert' for exhibition (votes 16 for), from Messrs. Luxford, Sawbridgeworth. See p. 535.
To Chrysanthemum 'Croesus' for cutting and market (votes unanimous), from Mr. J. A. Barrel, Bridgwater. See p. 535.
To Chrysanthemum 'Indiana,' for cutting and market (votes unanimous), from Messrs. J. & T. Johnson, Tibshelf. See p. 535.
To Chrysanthemum 'Sincerity' for cutting and market (votes 14 for), from Messrs. J. & T. Johnson, Tibshelf. See p. 535.
To Chrysanthemum 'Westbourne,' for cutting and market (votes 13 for, 2 against), from Messrs. J. & T. Johnson, Tibshelf. See p. 535.

Selected for trial at Wisley.

Perennial Aster 'Beechwood Challenger' from Messrs. Wood, Taplow.
Marigold 'Golden Crown,' from Messrs. Watkins & Simpson, London.

Other Exhibits.

Messrs. Clark, Dover : herbaceous plants and shrubs.
Mr. H. Cobbett, Woking : Chrysanthemum 'Rita Cobbett.'
Messrs. A. Dickson, Newtownards : Rose 'Alister Clark' (to be seen again).
Messrs. Goodliffe, Bishops Stortford : perennial Aster 'A. M. Carr.'
Mr. A. C. B. Ker, New Haw : dwarf perennial Aster.
Mr. E. Ladhams, Elstead : *Salvia coccinea* 'Elstead Crimson.'
Messrs. Wheatcroft, Gedling : Roses.
Mr. G. G. Whitelegg, Chislehurst : dwarf perennial Asters.
Mr. H. Woolman, Birmingham : Chrysanthemum 'Adelphi.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Cheal, Crawley, for berried shrubs.
To Hocker Edge Gardens, Cranbrook, for Cyclamens, Colchicums and other bulbous plants.

Flora Medal.

To Messrs. Russell, Richmond, for Clematis, Vitis and other climbing shrubs.

Banksian Medal.

To Messrs. Hemsley, Crawley, for berried shrubs.

Award of Merit.

To *Gypsophila Oldhamiana* as a hardy flowering plant (votes 10 for, 2 against), from Messrs. Watkins & Simpson, Drury Lane, London, W.C. See p. 535.

Other Exhibits.

Messrs. C. Elliott, Ltd., Stevenage : *Nerine Bowdenii* var.
Miss Hopkins, Coulsdon : hardy plants.
Mrs. Lindsay Smith, Chilworth : *Tricyrtis hirta*.
Messrs. Russell, Richmond : *Thunbergia grandiflora*, *Phyllocactus latifrons*.
F. C. Stern, Esq., Goring-by-Sea : Colchicum 'The Giant,' *Sternbergia lutea* var. *angustifolia*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and eight other members present.

No awards were recommended on this occasion.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, M.V.O., V.M.H., in the Chair and seven other members present.

Selected for trial at Wisley.

From T. Aley, Esq., Croydon : 'Lady Alice.'

From A. J. Cobb, Esq., Reading : 'Dane Way' (small Pæony).

From G. F. Drayson, Esq., Buckhurst Hill : 'Marianne.'

From Mr. J. T. West, Brentwood : 'Enid Rolfe' (Med. Dec.), 'Plato' (Med. Dec.), 'Robusta' (Charm), 'The Sweep' (Pompon), 'Tricolor' (Mignon).

A Dahlia was also submitted by A. F. Tofield, Esq., Southampton.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. J. N. BRIDGEFORD in the Chair, and seven other members present.

Award of Merit.

Carnation 'Vera' for market and exhibition, votes unanimous, shown by the Farnham Royal Nurseries, Slough. See p. 535.

Carnation 'Joyce' for market and exhibition, votes unanimous, shown by the Farnham Royal Nurseries, Slough. See p. 535.

Other Exhibits.

Carnation 'Eva,' shown by the Farnham Royal Nurseries, Slough.

Carnations 'Joy' and 'Lassie,' shown by Messrs. Walter Hemus, Ltd., Hanworth, Middlesex.

Carnation 'Golden Wonder,' shown by Messrs. Allwood Bros., Haywards Heath, and Messrs. C. Englemann, Saffron Walden.

OCTOBER 15, 1935.

Mr. T. HAY, M.V.O., V.M.H., in the Chair.

A lecture was given by Mr. E. L. Hillier, jun., on "Some Outstanding New and Little-known Trees and Shrubs."

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., V.M.H., in the Chair, and four other members present.

Phaseolus multiflorus.—Dr. Tincker exhibited the stems of runner beans grown with ten hours daylight, and ten hours daylight supplemented by five hours weak electric light. They show remarkable differences in length, and in elongation of the internodes. The plants with the longer period of light were normal, those with a shorter period of light had not elongated.

Chimera in Potatoes.—Mr. Crane showed photographs illustrating his work on the vegetative segregation of varietal characters. The internal tissues taken from the tubers of 'Golden Wonder' when isolated proved to be the variety known as 'Langworthy.' The isolation was made by a separation of the young shoots, and by the growth of adventitious shoots. This is a case of a periclinal chimera.

Androcymbium melanthioides was shown by Mr. W. F. Higgins of Northampton Road, Croydon. This interesting South African plant bears flowers resembling *Colchicum* to which it is related. A Botanical Certificate was awarded to this plant.

Abnormal Rose Hips.—Mr. Denham sent abnormal rose hips of the variety 'Madame Butterfly' showing an extrusion of the achenes beyond the fruit. He considered that weather conditions were partially responsible for this.

Gerardia purpurea.—Lieutenant-Colonel Messel showed a plant of *Gerardia purpurea* in full flower. This is an annual species recorded as semi-parasitic on a very wide variety of hosts, including many genera of grasses and broad-leaved plants.

Canarina abyssinica in full flower, was shown by Messrs. Russell of Richmond.

Colletia.—A pink *Colletia* was referred to the Committee from Floral Committee B. for naming. It was sent to E. Howarth, Esq., and fits very closely the description of *Colletia armata* Miers given by N. E. Brown in Gard. Chron. lx, p. 131, particularly in the dimensions of the spines and flowers. Mr. Howarth's plant is sparingly hairy, but according to N. E. Brown, *C. armata*, although usually pubescent, may sometimes be nearly or quite glabrous.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair and six other members present.

The business before the Committee consisted of many samples of Apples and Pears received for identification.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Flora Medal.

- To Mr. S. Ogg, Swanley, for Dahlias.
- To Mr. J. B. Riding, Chingford, for Dahlias.
- To Lady Yule (gr. Mr. H. Rideout), St. Albans, for Begonias.

Silver Banksian Medal.

- To Messrs. Allwood, Haywards Heath, for Carnations.
- To Messrs. Barr, London, for perennial Asters, Nerines, etc.
- To Messrs. Brown & Such, Maidenhead, for Dahlias.
- To Messrs. Cheal, Crawley, for Dahlias.
- To Messrs. Dobbie, Edinburgh, for perennial Asters.
- To Messrs. Engelmann, Saffron Walden, for Carnations.
- To Mr. E. J. Hicks, Hurst, for Roses.
- To Messrs. Lawrence, Chatham, for Chrysanthemums.
- To Messrs. Low, Enfield, for Carnations.
- To Messrs. Prior, Colchester, for Roses.
- To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Flora Medal.

- To Messrs. B. R. Cant, Colchester for Roses.
- To Messrs. Jones, Lewisham, for Chrysanthemums.

Banksian Medal.

- To Messrs. Baker, Codsall, for perennial Asters, Lupins, etc.
- To Messrs. Gibson, Cranleigh, for Dahlias and perennial Asters.
- To Mr. F. Ley, Windlesham, for Roses.
- To Mr. A. Miles, Bickley, for perennial Asters.
- To Messrs. Redgrove & Patrick, Sevenoaks, for Dahlias.

Preliminary Commendation.

To Nerine 'Joanna' (votes unanimous), from Col. H. C. Elwes, D.S.O., M.V.O. (gr. Mr. J. Goldsmith), Cheltenham. Umbel seven flowered. Flowers pure white, 2½ inches across. Raised by exhibitor.

The following Awards were recommended after trial at Wisley.

Award of Merit.

- To Aster 'Agnes D. Findlay,' from The Director, Wisley. See p. 534.
- To Aster 'Alderman Vokes,' from Messrs. Barr, London. See p. 534.
- To Aster 'Palmyra,' from Mr. T. Bones, Cheshunt. See p. 534.
- To Aster 'Red Rover,' from Messrs. Wood, Taplow. See p. 534.
- To Aster 'Remembrance,' from Messrs. Barr, London. See p. 534.
- To Aster 'Ring of Roses,' from the late Hon. Vicary Gibbs, Elstree. See p. 534.

Highly Commended.

- To Aster 'Blue Baby,' from Messrs. Simmonds, Kings Langley. See p. 534.
- To Aster 'Daphne,' from Messrs. Barr, London. See p. 534.
- To Aster 'Mabel Blakey,' from the Director, Wisley. See p. 534.
- To Aster 'Voke's Pink,' from Messrs. Barr, London. See p. 534.
- To Aster 'White Button,' from Mr. E. Ballard, Colwall. See p. 535.

Other Exhibits.

- Misses Allen-Brown, Henfield : Violets.
- Mr. H. A. Greenslade, Tunbridge Wells : Chrysanthemums.
- Lionel de Rothschild, Esq., Exbury : Nerine 'Apache.' (P.C. 1933).
- Messrs. Wheatcroft, Gedling : Roses.
- J. Wilson, Esq., Nuneaton : Chrysanthemum 'Princess Marina.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

- To Messrs. Cheal, Crawley, for ornamental trees and shrubs.

Silver Flora Medal.

- To Messrs. Waterer, Bagshot, for ornamental trees and shrubs.

Silver Banksian Medal.

- To Messrs. Hillier, Winchester, for shrubs.
- To Mr. E. Ladhams, Elstead, for shrubs and herbaceous plants.

To Messrs. Neale, Newhaven, for succulent plants.
To Messrs. Wm. Wood, Taplow, for ornamental trees and shrubs.

Flora Medal.

To Messrs. Burkwood & Skipwith, Kingston, for shrubs.
To Colesbourne Gardens, Cheltenham, for bulbous plants.
To Messrs. Stewart, Ferndown, for shrubs.
To W. G. Theobald, Esq., Steyning, for Cotyledons and Echeverias.

Banksian Medal.

To Alpine Nurseries, Ltd., West Moors, for rock garden plants.
To Messrs. Hemsley, Crawley, for shrubs.
To Messrs. Russell, Richmond, for Vitis and Clematis.

Preliminary Commendation.

To *Agalinis purpurea* (votes unanimous), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross, Sussex.

Award of Merit.

Gentiana × *Macaulayi*, Kidbrooke Seedling, as a hardy flowering plant for the rock garden (votes unanimous), from R. Olaf Hambro, Esq., Forest Row. See p. 535.

Other Exhibits.

Messrs. Clark, Dover : shrubs.
Mr. A. Corderoy, Eltham : rock garden plants.
W. F. Higgins, Esq., Croydon : *Androcymbium melanthioides*.
Miss Hopkins, Coulsdon : hardy plants.
Edward Howarth, Esq., C.B., C.B.E., Kirdford : *Colletia armata*.
The Lady Rayleigh, Chelmsford : *Cyclamen neapolitanum*.
Messrs. Russell, Richmond : *Canarina abyssinica*.
Mr. R. Colpoys Wood, West Drayton : shrubs.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and thirteen other members present.

Awards Recommended :—

Award of Merit.

To *Vuytskeara* × 'Anglia' (votes unanimous), from Messrs. Charlesworth, Haywards Heath. See p. 535.

Silver-gilt Banksian Medal.

To Messrs. Stuart Low, Jarvis Brook, for a group.

Other Exhibits.

Sir Jeremiah Colman, Bt., Gatton Park, Reigate : a group.
Messrs. H. G. Alexander, Tetbury : a group.
Messrs. Charlesworth, Haywards Heath : a group.
Messrs. McBean, Cooksbridge : a group.
Messrs. H. Dixon, Wandsworth : a group.

EXHIBITION OF PAINTINGS AND DRAWINGS.

OCTOBER 15-17, 1935.

Awards Recommended :—

Silver-gilt Grenfell Medal.

To Frank Galsworthy, Esq., Green Lane Farm, Chertsey, Surrey, for Iris Paintings of Botanical Interest.

To Mrs. Vera Higgins, 28 Northampton Road, Croydon, for Flower Paintings of Botanical Interest.

To H. Davis Richter, Esq., R.I., R.O.I., R.B.C., 5 Redcliffe Square, London, S.W. 10, for Flower and Fruit Pictures.

To Lady Beatrix Stanley, C.B.E., Sibbertoft Manor, Market Harborough, for Flower Paintings of Botanical Interest.

To Harold A. Thomerson, Esq., St. Margarets, Church Hill, Loughton, Essex, for Drawings of Botanical Interest.

Silver Grenfell Medal.

To Miss Frances L. B. Bunyard, Newland, Guildford Road, Horsham, Sussex, for Fruit Studies of Botanical Interest.

To Augustus W. Enness, Esq., 13 Elvaston Place, London, S.W. 7, for Flower Pictures.

To the Rt. Hon. Sir Herbert Maxwell, Bt., K.T., F.R.S., V.M.H., Monreith, Whauphill, Wigtownshire, for Flower Paintings of Botanical Interest.

clxxviii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

To Mrs. Mary E. Oddie, Thurlstones, Sibford, Banbury, Oxon, for Flower Pictures.

To Miss Clara E. Peters, Arlington Court, nr. Barnstaple, N. Devon, for Flower Paintings of Botanical Interest.

To Mrs. Amy C. Reeve-Fowkes, N.S.A., Manor House, 9 Borough Lane, Eastbourne, for Flower Pictures.

To Miss Eva Savory, Sandgates, Chertsey, Surrey, for Flower Pictures.

To Miss Lilian Snelling, Spring Hall, St. Mary Cray, Kent, for Pæony Paintings of Botanical Interest. (Lent by F. C. Stern, Esq., F.L.S., Highdown, Goring-by-Sea, Sussex.)

To Madame Helene von Blaas, Wien IV, Theresianumgaas 25, Austria, for Paintings of Flowers.

To Frederick C. Williams, Esq., 50 Vincent Square, London, S.W. 1, for Flower Pictures.

Grenfell Medal.

To E. A. Bowles, Esq., F.L.S., V.M.H. Myddelton House, Waltham Cross, Herts, for Flower Paintings of Botanical Interest.

To Hon. Mrs. Robert Boyle, Pulborough, Sussex, for Pictures of Gardens.

To Miss E. M. Burgess, R.M.S., 140B Kensington Park Road, London, W. 11, for Flower Pictures.

To Miss I. M. Charters, 34 West Avenue, Leicester, for Flower and Fruit Studies of Botanical Interest.

To Mrs. Ethel B. Davies, 16 Buckingham Palace Gardens, London, S.W. 1, for Flower Paintings of Botanical Interest.

To Miss C. du Plessis, 24 Rivers, P.O. Holfmanshof, Cape Province, South Africa, for Flower Paintings of Botanical Interest. (Lent by the High Commissioner of South Africa, South Africa House, Trafalgar Square, London, W.C.)

To Lieut. Commander J. P. W. Furse, R.N., 10 Bramley Flats Crescent, Alverstokey, Hants, for Flower Studies of Botanical Interest.

To Miss Eliza Macfarlane, 38 Cintra Park, London, S.E. 19, for Paintings of Orchids.

To John Nash, Esq., Meadle, Aylesbury, Bucks, for Flower Studies.

To Miss Ethel Margaret Phillips, 68 Hereford Road, London, W. 2, for Flower Paintings of Botanical Interest.

To Miss Dora Ratman, Flat F., 46 Belgrave Road, London, S.W. 1, for Flower Pictures.

To Miss Gwendoline M. Rowland, 9 Sandwell Mansions, West End Lane, London, N.W. 6, for Flower Pictures.

To Mrs. Philippa A. F. Stephenson, 75 Carlisle Mansions, London, S.W. 1, for Paintings of Botanical Interest.

To Arthur G. Stubbs, Esq., 71 Berriedale Avenue, Hove, Sussex, for Paintings of Botanical Interest.

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ERRATA AND CORRIGENDA.

- P. 91, line 20, for *Anacrinum*, read *Amarcrinum*.
P. 109, line 3, for *calandrinoides*, read *calandrinoides*.
P. 126, line 15, for Stanclot, read Stanleot.
P. 157, fig. 38, for *Marsonnina*, read *Marssonina*.
P. 164, fig. 43, for KAROO, read KARROO.
P. 210, line 42, for *membranacaeus*, read *membranaceus*.
P. 223, lines 30 and 31, for An Incomparabilis variety (Division 2a), read (Division 1a).
P. 248, line 40, for *Diosphaeria*, read *Diosphaera*.
P. 255, lines 5 and 12, for *Baueri*, read *Baurii*.
P. 258, line 9, for *Eccreomcarpus*, read *Eccremocarpus*.
P. 289, fig. 84, for ZANEDESCHIA, read ZANTEDESCHIA.
P. 320, line 38, after 'Theodora,' insert A.M. May 21, 1935.
P. 322, line 40, omit *Lodari*.
P. 419, line 26, for Bees, read Bakers.
P. 433, line 20, for *Huernia*, read *Huernia*.
P. 472, line 23, after York," insert By Richardson Wright.
P. 517, line 23, for *Franchetiana*, read *Franchetianum*.
P. xxv, line 14, for *Brearlyana*, read *Brearleyana*.
P. cxv, line 43, for *longiracemosa*, read *longiracemosum*.
P. cxxii, line 51, for *Roettlera*, read *Roettlera*.
P. cxxvii, line 49, for Embly, read Embley.

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